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Modern theatres

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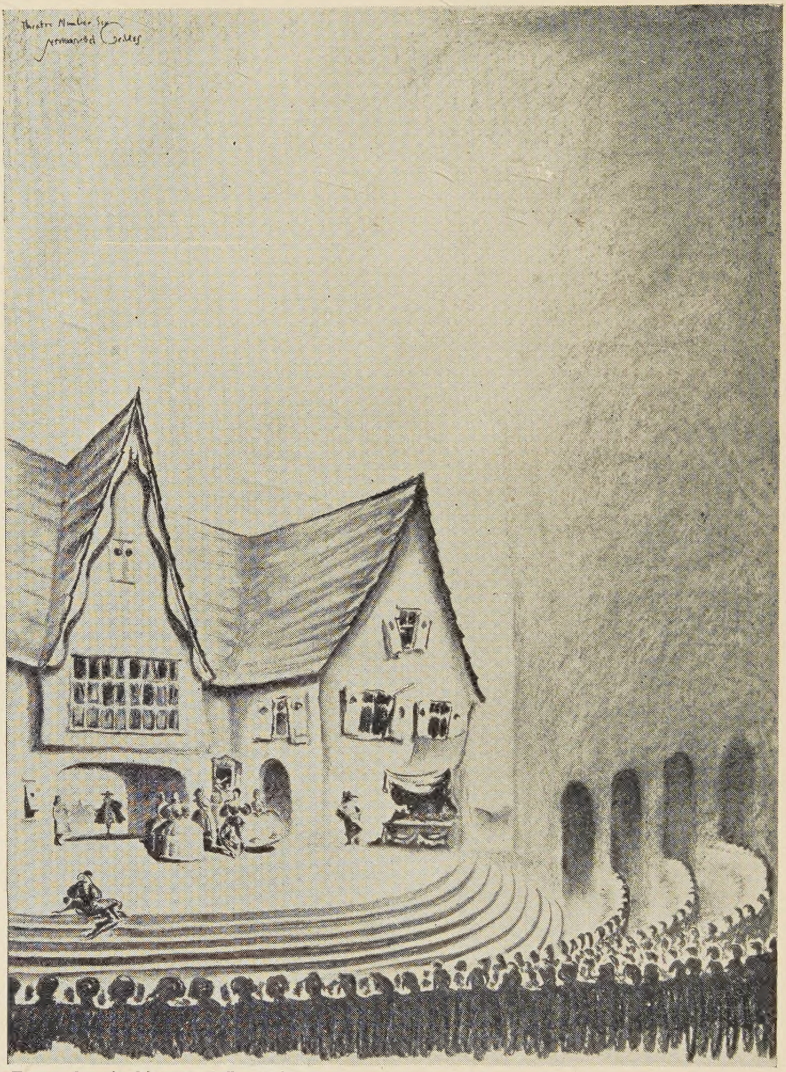

From the Architectural Record.

Erminie, as Norman-Bel Geddes would produce it in his theatre without a proscenium. (See page 72.)

MODERN THEATRES

BY

IRVING PICHEL

WITH MANY ILLUSTRATIONS

10937
VINCENNES UNIVERSITY.

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Introduction

ARCHITECTURAL ineptitudes are more likely to be perpetuated and in time condoned than those in any other art. Generally speaking, a bad painting is scrapped, poor music remains unpublished and unplayed (along with much good music, no doubt), and bad books, after a time, cease to be read. But a building is somehow inescapable. Having a durability that needs no treasuring, and being erected more often for use than for beauty, a building generally achieves longevity, and the bad art crumbles no sooner than the good stone. Usefulness, great initial cost, sturdy stuff, are all against a building's being put out of the way merely because it is ugly. Or even, as a matter of fact, because it does not successfully serve the purpose for which it was erected.

As people live in a house, or work, day after day, in a store or factory or public building, they become used to inconveniences, bad arrangement, and lack of proper facilities. They complain for a time, perhaps, and then forget. And after a while, when the house has become home, or the large building has gathered tradition, a sort of admiration settles upon it. What is really plain ugly or wrong or bad appears quaint and full of "atmosphere." And is imitated. Style and tradition embalm the very features that make the building a bad building.

In the theatre, this perpetuation of musty, tradition-hallowed faults of construction has been carried to an extraordinary extreme. There is more ritual, one might believe, in constructing a stage and auditorium in accordance with honored custom than there is in the building of a church. In some of the more modern professional theatres, and in a few of the best and newer little theatres there have been notable improvements over the theatres of a generation ago; but in the auditoriums and stages of schools, clubs and societies, and in other public or semi-public buildings in which such facilities are included as a sort of side issue, the ancient law is still largely observed. The average high school stage seems to be inspired by the faint recollection of a visit to the theatre, supplemented by the examination of old prints illustrating the stage of Inigo Jones.

To-day, as if by a concerted movement throughout the country, hundreds of community houses are being erected, designed to include facilities for all the social and recreational interests of the communities they will serve. Practically all of them will include stages and auditoriums. At the same time, hundreds of new school buildings are being planned, and these, too, will have stages intended to be useful for dramatic productions. Little theatres, of varying size and equipment, are called for by the semi-professional and amateur groups from coast to coast who, after years of experiment, have earned their right to permanent homes. But unless architects have at their disposal much more technical knowledge of the producers' requirements than in the

past, it is certain that most of these theatres and auditoriums and stages will be bad—as are the auditoriums and stages in most existing schools. It is to forestall some of the commonest mistakes that this book is written—to describe them in detail, and to set up against them the ideal features toward which the designers of such structures should strive.

In every community of moderate size and culture there is a releasing to-day of dramatic impulse, and folks turn more and more toward the theatre as a mode of group expression. The Little Theatre movement, with five hundred or more centers bubbling over with life, is an evidence of the birth of a new theatre in this country. Innumerable community pageants and masques are an indication that people turn to the drama as a means of expressing their corporate æsthetic. The production of good plays by schools and colleges, the interest such institutions are showing in playwriting, designing and production, and in the fostering of an indigenous drama, the widespread discussion of the drama and the theatre by clubs and reading circles, all are portents of a theatre that shall be a vital and integral part of our daily community life. The system of wholesale manufacture and distribution of theatre products is on the wane, and the theatre as an art, as a social institution of the rank and significance of the school or the church, may soon have the field to itself. Hourly, in the little theatres, in community drama undertakings, in the municipal theatres, in the classrooms and the clubs, and on the school stages, the new theatre is growing up.

One of the finest services that the municipal theatre or community house can render is to provide a home for the dramatic impulse of the community—not a makeshift home, but one worthy of the fine art of the drama and the fine craft of the theatre. It does not matter whether or not the building is to be large and pretentious or small and inexpensive; but it matters that it should be fitted to the least detail to fulfill its function efficiently and beautifully.

I do not write these pages as an architect or as an instructor of architects, but as one knowing fairly well the conditions which a stage has to meet when it is used for dramatic representations of any sort. In the course of a rather varied experience in the theatre—amateur and professional, little and big, commercial and "art"—I have encountered practically all the mistakes that are made in stage construction. I have found them to be of two sorts: mistakes of imitation, and mistakes of ingenuity.

The first type of mistake is easy enough to account for. Usually, the auditoriums and stages of schools have been intended primarily for use as "chapels" or assembly halls. There has been a feeling on the part of school authorities that the dramatic instinct is in some way unwholesome and that its expression should be discouraged. As often as not the design of the school stage has been a conspiracy to thwart its growth. The attitude of the authorities has recently changed somewhat, but with the change has come very little more intelligence in the matter. Where, before, they were careful to obstruct, they are now merely negligent, leaving the architect to his own devices. The proceeding is very

much at random, and experts are rarely consulted. It is not wholly the architect's fault that he builds as he does. Opportunities to build stages are not frequent; he knows more about building them than using them, and the models he follows have not been often enough refreshed by the innovations of theatre experts. His patterns are largely outmoded. In the largest high school in one of the greatest midwestern cities, I have seen a stage built only a few years ago in which is exemplified almost every stage feature of the civil war period—a vast curved apron, grooves for wings, and a stage floor sloping from the back wall toward the footlights. In addition, there are one or two mistakes peculiar to high schools—notably the omission of an entrance to the stage, save on one side.

The other type of error which one encounters is usually made by a clever man who has observed the more modern practices in building large theatres and attempts to adapt them to a space utterly inadequate or wrongly shaped for the purpose. Usually he cramps his space hopelessly and renders it even less useful for its purpose than it might have been had no such ingenuity been displayed. One of the first little theatres, the finely equipped stage of the Artists' Guild Theatre in St. Louis, was an admirable replica in little of a fully equipped stage of the commercial theatre. But the stagehouse was so small that the fly gallery at the left and the paint bridge at the back were a constant embarrassment. The stage would have been more workable if these devices had not been employed. These errors of construction, after all, indicate but one thing—that the stage

has been regarded as a characteristic type of structure, to be built according to established rules, rather than as a place designed to fulfill a peculiar function.

A stage is a space on which a dramatic action is to be revealed before an audience. Whatever the space at the builder's disposal—its size or shape—or whatever the building he must remodel, that is the only thing to be considered. A play is to be given. The players must be seen and heard. There must be means for them to enter the presence of the audience, and exit. The space on which they appear must be illuminated. Somehow the space set aside for the player shall be able to suggest, either by means of scenery as it is commonly understood, or by some conventional arrangement, permanent or variable, a world in which the character he portrays might move.

Beginning with this much specification and no more, I propose to work out with some definiteness the principles underlying the construction of an ideal stage and the relation of the auditorium to it, bearing in mind all the while the fact that many of the stages in the community houses and little theatres are to be small, that large sums cannot always be spent on them, and that they must in most cases serve a variety of purposes.

If we remember always the function our stage is to fulfill, we have two good sources from which to draw practical details for its construction, and a third source, debatable but interesting. First, there are the errors which I have referred to. Some of these I shall discuss in detail in the next chapter. Then, most valuable of all sources, are the con-

clusions to be drawn from the practice of the most skilled architects and artists of the theatre. And finally, to be considered briefly, there are speculations as to the demands which the drama of the future may make on the theatre—demands that can be forecasted inaccurately at best, but deserving a glance, perhaps, if only to call attention to the certainty that such demands will be made.

Modern Theatres

Chapter 1

ARCHITECTURAL TRADITION IN THE THEATRE

THERE are, of course, other types of auditorium and platform than that of the theatre. Churches, lecture halls, and the chambers of legislative assemblies are planned with the same general end of making a person or persons at one part of the room audible and visible to many persons gathered in another part. The ready defense of much bad planning in school auditoriums is that they were not modeled after theatres but after one of these other forms. To-day this will not serve as a defense. Interest in the drama is too widespread, and recognition of the social potency of the theatre is too general. And whereas none of these other forms of audience chamber meets the needs of the theatre, a well-planned theatre can serve any use to which a gathered community may care to put it.

The rocks which threaten disaster to our intent to devise a room which may serve as theatre, assembly hall, chapel, or whatever, are, if we go to beginnings, the traditional form of the theatre and its traditional *décor*. In the latter, time has wrought many changes. It was once felt that a theatre was not a theatre if it was not adorned with a wealth of gilded cupids, masks, tambours, and daggers, surrounded by stucco wreaths and garlands in high relief, and inter-

spaced with pictured panels of the muses, especially those most at home in a playhouse. And, indeed, about those old houses, their garishness now mellowed, there is a glamor peculiarly of the theatre, and a sweet mustiness in the air bespeaking audiences of perfumed ladies, long since dead, the grease-paint and pomade of a long line of players, old scenery, the fine fustian of the old plays. It is somewhat like the odor in a garret stored with the treasures of our grandparents, or the mustiness of an old book. But these are faded flowers that cannot be brought to life, and the theatre of to-day, its plays and its players, are moved by a different spirit. Whatever lure these tinselly old temples have is a reminiscent one. To-day, there may be found theatres with the simplicity and peace of a church, the unobtrusive luxury of the drawing-room, and even, by overshooting the mark of simplicity, the bareness of the lecture-room or the legislative chamber.

The greater sincerity that has come into the theatre, and that fear of romance that marked the first quarter of the Twentieth Century, did much to overcome traditional over-elaboration. There has come, too, a marked freedom from tradition in the planning of the usual large show-houses. The more modern theatres are, for the most part, free from those glaring structural ineptitudes that several centuries of custom had imposed. In Germany especially (the traditional form of the theatre did not develop there), great progress has been made, and the theatres of such architects as Max Littmann and Oskar Kaufmann serve as models. Stage machinery in Germany has been brought to a point

The Theatre of the Romans. The Greek theatre made more compact by joining auditorium and stage building. The action is confined to the stage, and the orchestra pit is added to the seating space. The background is elaborately designed in architectural ornament—but still is "real" and permanent. (A measured reconstruction of the Roman Theatre at Orange.)

The Teatro Olympico at Vicenza—the true "renaissance" playhouse. The Teatro Olympico is practically a small Roman playhouse roofed over. It has the same auditorium and half-orchestra, and the same actual stage background of architectural ornament. But the masques have contributed one feature, the "make-believe" vista through the three stage portals—the beginning of scenery; and the central doorway has been appreciably widened and heightened the better to display one of these "perspectives." (From a photograph by Alinari.)

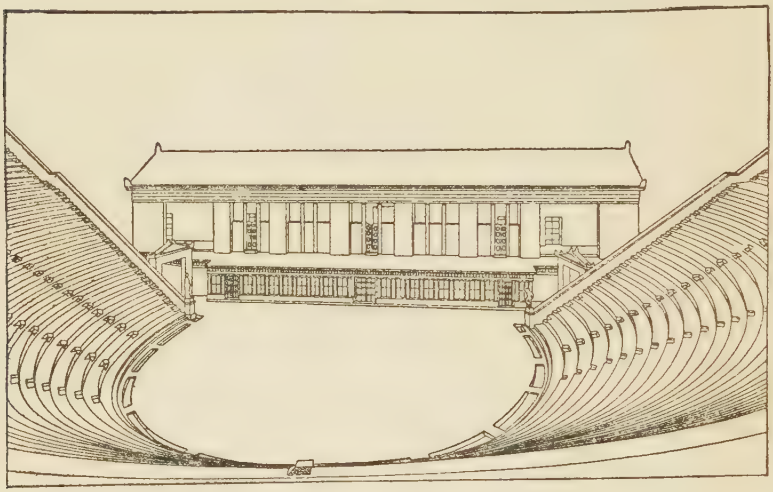
of perfection not yet reached in any other country. Lautenschlager, Brandt, and Fortuny (a Spaniard) have contributed inventions that have only occasionally been experimented with in this country, and then somewhat half-heartedly.

Tradition clings close to its native heath, nevertheless, and in England, to which America looks first, perhaps, and in the Latin countries, it has enough vitality still to be a source of danger. It may be worth while to scan the history of the tradition, especially from the "front of the house," before we consider the stage itself. For it is from here that the gravest criticism against a stage can be made—that it is not easily visible from all parts of the house.[1]

The form of the stage and the manner in which it has been used have, throughout the history of the theatre, been the primary factors in determining the shape of the auditorium. The Greek theatre was devoted to a ceremonial drama in honor of Dionysus, acted about an altar erected to him. So the stage took the form of a circular space with an altar in the center. The seating was arranged in concentric tiers, with the altar as a center, and more than half surrounded the stage space or orchestra. Tangent to this circle, and perpendicular to a line drawn through the center of the seating space, was built the *skene,* or back scene. At first, this was merely a dressing tent; later it was a wall, of wood or stone, masking the dressing-rooms of the actors.

[1] I shall not consider it expedient, in any part of this discussion, to go into questions of engineering detail. It is assumed that the architect is equipped or will equip himself with such technical knowledge. Nor shall I refer to structural modifications brought about by the regulations of Boards of Fire Underwriters. These matters have been treated more or less efficiently in several other works, to which reference will be found in the Appendix.

It was pierced with doors, giving access to the stage before it, and served as the palace, temple, or city wall, in front of which the scene of the play was laid. There is no satisfactory evidence that it gave on to a raised space conforming to the later stage platform. Chorus and actors were on the



A reconstruction of a Hellenistic theatre at Ephesos. Auditorium, orchestra, platform, and architectural background. A simple plastic stage. (From Fiechter's *Die baugeschichtliche Entwicklung des antiken Theaters.*)

ground level of the orchestra. All the seats being raised, the spectator looked down upon the action of the play, and all the seats were set on radial lines drawn from the altar or center of the orchestra.

In the Roman theatre, a number of radical changes are to be noted. The large orchestra is no longer needed for a chorus, and the space is cut to a semicircle, in which are

placed the chairs of the Senators. Since spectators are now on the ground level, the actors must be raised, and the stage becomes a long, shallow platform, beginning at the diameter of the circle. Raised tiers of seats, as in the Greek theatre, surround the semicircular ground space. At the back of the stage is a wall, or *scœna*, which also closes in each side of the stage, meeting the seats at the diameter ends. It is built to the height of the uppermost tier of seats. Since the stage extended almost the whole width of the seating, and was raised above the ground, sight lines were ideal.

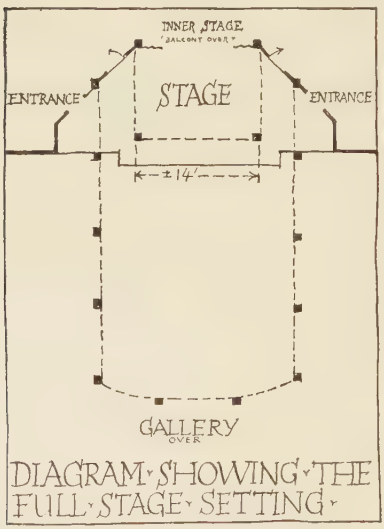
Between the fall of the Roman Empire and the revival of classic learning in Italy, the theatre had no settled home. The drama went through various vicissitudes, took on new functions, expressed itself in new forms. The mediæval theatre of mysteries and miracles, after it had become secularized, went forth from the chancel of the church, and became a vagrant and an opportunist. It set up its paraphernalia in the public square, in the inn-yard, in the guild hall. For the most part, it was a daylight, outdoor recreation, with no fixed home, and no such special ceremonial functions as in the Greek and Roman state. It was proletarian, distinctly. With the Renaissance, in addition to the popular itinerant theatre of the people, there were two new manifestations. The humanists, in their academies, revived the Roman comedies of Plautus and Terence; the courts of the ruling families of the free cities became the scenes of magnificent productions of masques, pageants, "triumphs" and fêtes. These were usually allegories based on classic mythology or on ancient history, but presented

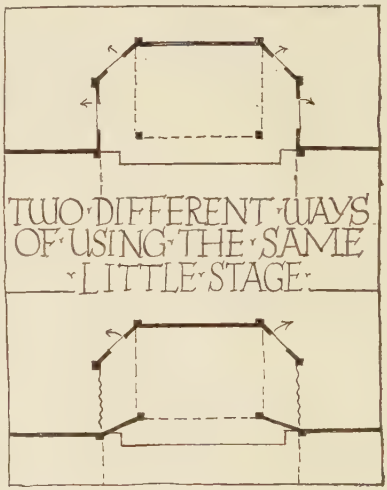
largely in the form and manner of the popular drama of the time. To the presentation of the court fêtes, the greatest artists—Bramante, Leonardo da Vinci, Giulio Romano, etc.—brought their talents. They were given in the gardens of the palaces at night, illuminated by flares and fireworks. The "pageant" or wheeled stage of the mediæval popular drama was used for the display of some large piece of decoration or machinery. As early as 1491, however, at Perugia, the first indoor performances were given. The stage went through various modifications, still keeping its resemblance to the stage of the mediæval drama, until one invention enforced the most radical development that had yet taken place—perspective scenery.

Hammitzsch [2] traces the invention of scenery in painted perspective to Bramante's decoration of the sacristy of the Church of San Satiro in Milan. The wall painting represents in perspective an extended vista of the sacristy, in an attempt to make it appear larger. The modern counterpart is the mirrored restaurant. It is certain, at all events, that Peruzzi employed such scenery in dramatic representations in Rome before 1510. With these painted prospects came a variety of changes in the arrangements of the rooms in which the masques were given; the stage became more a place apart; it was set at the end of the room rather than along the sides, that the effect of distance produced by the painted prospects might be enhanced, and the proscenium frame enclosed it. However, when the theatre as a building designed specifically for the presentation of plays came

[2] Hammitzsch, *Der Moderne Theaterbau*, I. Teil, p. 11.

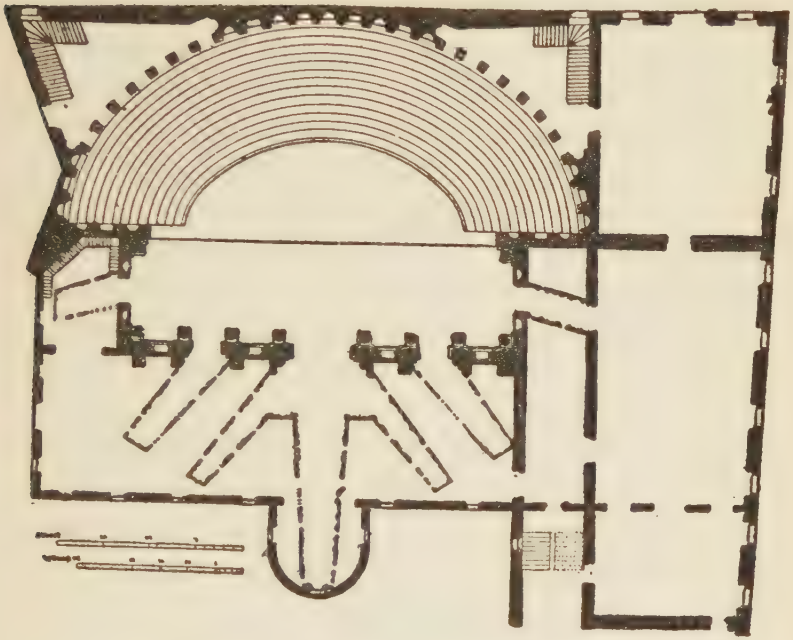
A modern Little Theatre in Elizabethan form. This plate and the next show three uses of the Maddermarket Theatre in Norwich, England. Above, the normal pseudo-Shakespearean stage. At the rear are the inner stage, or study, and the balcony, which, with the permanent entrance doors in the slanting walls at right and left, were essential features of the Elizabethan stage. Its main stage is the least satisfactory feature of this theatre. For the size of the building; it is as deep as the stage of the Globe; but it is far too wide. The audience cannot surround the playing space on three sides as it did the forestage of Shakespeare's theatre. On the following page are other sketches by Owen P. Smyth showing the rearrangements of the stage for a Greek tragedy and a relatively modern play requiring scenery.





Above, the stage of the Maddermarket Theatre arranged for a Greek tragedy by the drawing of curtains between various pillars. A permanent architectural scene is placed in the portion of the Shakespearean stage directly in front of the "study" or inner stage. The plan at the left is for the Shakespearean stage.

into being, the form of auditorium was not so thoughtfully adapted to this new type of stage as had been the case with the ancient theatres. For it was to them that architects turned for models for the auditorium, though the stage



Plan of the *Teatro Olympico*, Vicenza

was no longer the stage that went with the amphitheatre form of seating.

The theatre of the Academy of Olympians at Vicenza, begun in 1580 by the architect Palladio and completed in 1584 by his son Scillo, is practically a Roman theatre roofed over, and equipped with a stage that compromises with the stage then in mode. It has a sloping floor (to increase the

effect of the perspective) and alleys of scenery giving off each entrance-way in the stage wall.

The Teatro Farnese in Parma, completed in 1619 by Aleotti, is the first modern theatre. In it appear theatre features that have come down to our own day—the elongation of the amphitheatre auditorium into the horseshoe form, and a stage completely separated from the auditorium and equipped not only to handle the new scenery but to manipulate it quickly, so that changes of scene might be effected in the presence of the audience. In this theatre Aleotti not only broke away from the classic stage but also from the multiple setting of the mediæval stage and definitely introduced the modern form of picture stage. Less completely did he break away from the classic seating, but he modified it somewhat to meet new conditions.

With Aleotti passed the period of primitive experiment with a new instrument. From his day until very recent years, there was to be no marked change, except the introduction of balconies, a feature already anticipated in the theatres of other countries and soon employed in Italy, and the further accentuation of the horseshoe form. The old circle plan became an ellipse, and still later, as the side balconies were brought in closer to the stage, an oval.

In England, very much the same history was enacted. The old English miracle and mystery gave the theatre its platform stage, but the imitations of Latin comedy first gave it a permanent home.

Public performances of university-made imitations of Roman comedy were common during the reign of Edward

the Sixth, and during the reign of Elizabeth (1558-1603) seventeen professional theatres were licensed for the exhibition of contemporary plays. In something like sixty years, the English drama and the English theatre had grown from crude beginnings to the highest point they have yet reached. And it was by professional companies of actors presenting dramas and not by the court or academic presentations, that the theatre was first given form. These companies, like the craftsmen bands of miracle and mystery players, acted wherever they could find a place or wherever they were bidden—at court, in great halls; in the provinces, in the church or the moot hall or the inn; and in London, in the inn-yard or bear pit. It was the inn-yard that was most used and had the greatest influence on the form of the playhouse.

The inns were usually built in the form of a hollow square. A small passage gave access to the inner court, which was surrounded by galleries. The stage would be erected at the end of the court opposite the entrance, and spectators stood on the level ground of the yard or found seats in the galleries. The bear pits or bull rings were usually circular buildings with several galleries similar to those of the inn-yards.

The earliest theatres, built about 1576, were round in shape, with these characteristic galleries. They seem to have been used interchangeably for theatrical performances and for bear-baiting. The centers were open to the sky, like the inn-yards, and only the galleries and part of the stage were roofed. The stages projected into the center, and

could be viewed, both by spectators on the ground and by those in the galleries, from three sides. The only contemporary drawing of the Elizabethan stage is that of Johannes De Witt of the University of Utrecht, who visited London in 1596. His drawing of the Swan Theatre differs in many details from the specifications of the contract, but it gives a general idea of the form of auditorium and stage. With the building of these theatres—The Theatre, The Curtain, The Hope, The Globe, Blackfriar's, The Swan—the use of the inn-yards did not cease, and the Queen's men performed regularly at The Boar's Head in Eastcheap as late as 1603.[3]

Contemporaneously, there were in England, as abroad, spectacular performances at court, richly costumed and decorated. They were performed in spacious palace halls, being acted on pageant wagons or on the main floor, and were viewed from benches and balconies around the sides. Eventually the pageant gave way to a stage temporarily erected at one end of the room, the dancers descending to the main floor for large ensembles and ballets. As early as 1607, scenery, curtains, and a proscenium arch had been used. The picture stage, with its scenery in painted perspective, was an importation from Italy, following a visit there of Inigo Jones, and under his hand reached a high degree of development during the third decade of the Seventeenth Century.

With the reopening of the theatres after the Restoration, the practice of the Italian theatre and opera house superseded the old English tradition practically altogether, the

[3] Ashley H. Thorndike, *Shakespeare's Theatre*, p. 42.

Contemporary sketch of an Elizabethan Theatre. (From Caffin's *Appreciation of the Drama.*)

only noteworthy remnant being the social distinction that made the ground level, or "pit," the place of the proletariat in the theatre. The visits of the aristocracy to the theatre during the Elizabethan period, even when theatres were under court patronage, were something in the nature of an escapade. The sheltered galleries were reserved for the gentry, and the unroofed ground space or pit was open to the crowd. From the galleries, moreover, a better view of the protruding three-sided stage was to be had. In the later, wholly roofed theatres, the stage still protruded somewhat. A great curved "apron" projected beyond the proscenium. Nor was the proscenium the mere picture-frame of to-day, but a deep portal. The balconies extended over the stage to the curtain, so that spectators at the forward ends of the balconies were directly above the stage. The balconies were given swelling curves, bringing them further toward the center of the stage, so that those who occupied these forward seats could not only see but could be seen. The stage boxes of to-day are a relic of this type of apron-stage theatre, and to-day, with the picture frame stage, serve no purpose but the stupid social one of self-display.

The apron stage preserved one great advantage of the platform stage: that of keeping the stage grouping, for at least a part of the audience, plastic. And the dimness of candle or oil footlights compelled the actors to keep to the front of the stage as much as possible. The disappearance of the apron has been due wholly to the improved lighting of the modern theatre. With its disappearance should go

the auditorium features that belonged with it. And even though there have been occasional reversions to the platform stage and apron in the productions of Granville Barker or Jacques Copeau, there is no occasion for the revival of the horseshoe balcony or the stage box. In later pages of this book, where I deal specifically with the stage, I shall recommend provision being made for an apron, either permanent or movable; but the auditorium should not revert.

Mosaic by Albert Herter, in the Martin Beck Theatre.

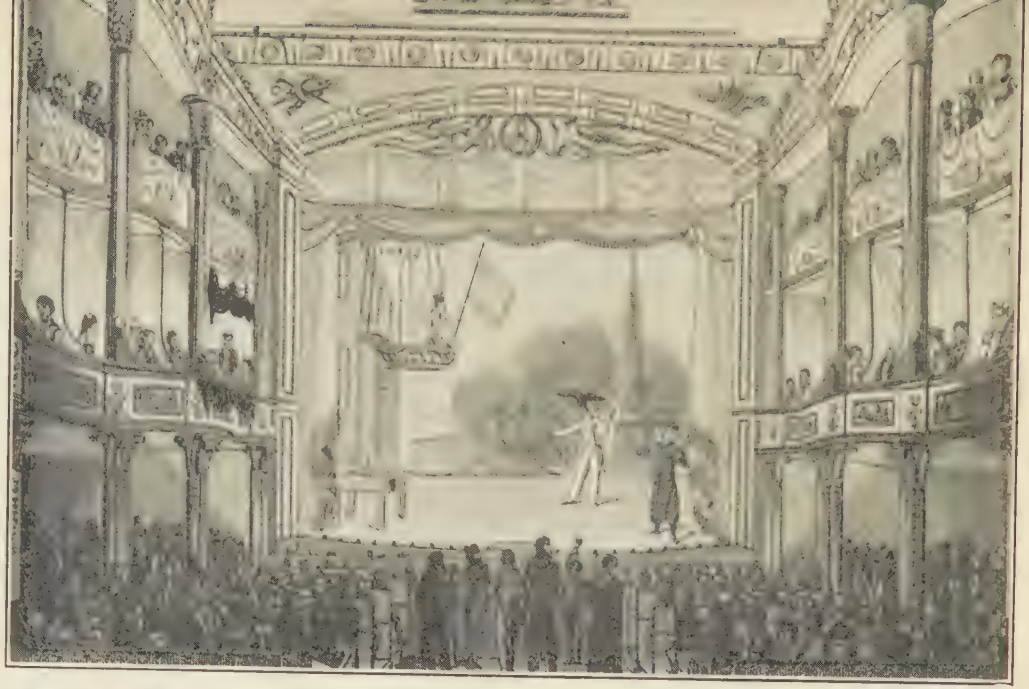
Chapter 2

THE AUDITORIUM

With modern resources in lighting and construction engineering, most of the "practical" considerations that determined the form of the old houses do not apply, and the social considerations that called for the display of certain parts of the audience are not even tacitly acknowledged in the more democratic theatre of to-day, except at the opera. Accordingly, the procedure of the architect should be governed wholly by considerations of utility.

The first consideration is that of visibility. A sight line drawn from any seat in the auditorium should give a clear view of the entire stage. As a general rule, therefore, the seating space should be very little wider than the stage opening. A sight line drawn from a seat to the right or the left of the proscenium arch past the corresponding side of the arch will cut off that corner of the stage. The closer the seat is to the stage the greater is the part of the stage concealed. Accordingly, it is the custom in most modern theatres to narrow the auditorium as it approaches the stage, so that the front of the seating is no greater in width that the width of the proscenium. The rear of the auditorium is slightly wider.

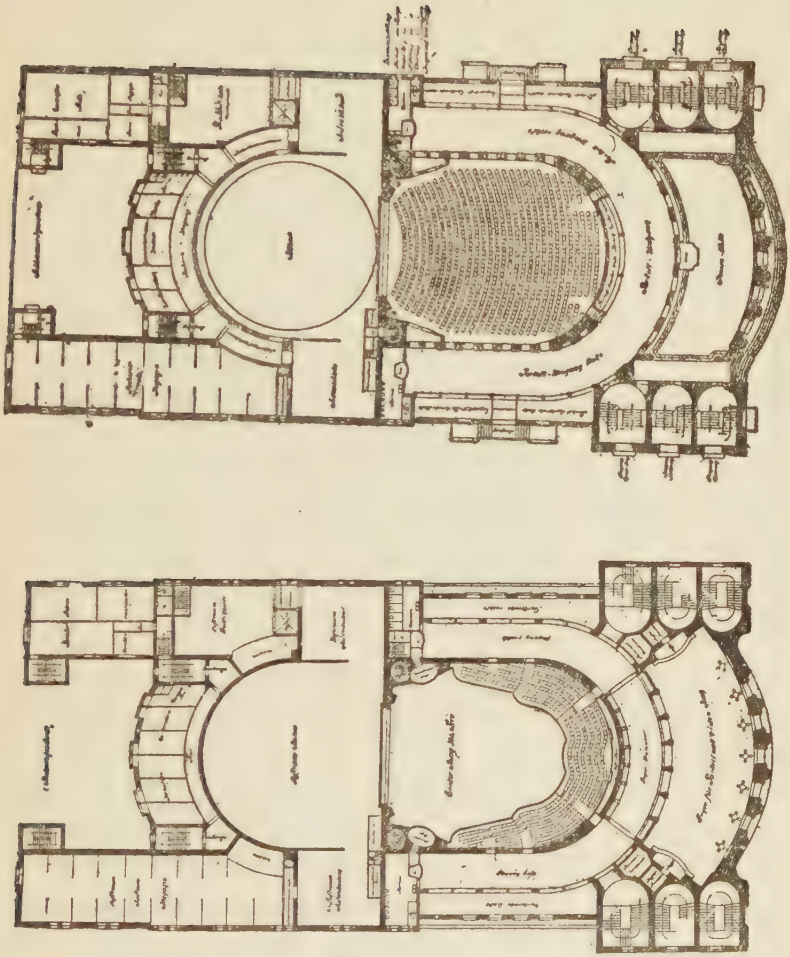
As a concession to this plan, the back of a stage setting is often narrower than the front. That is, in the case of



At the old Josefstädter Theater in Vienna Max Reinhardt is engaged in an attempt to revive the glories of the acting company, repertory, and mise-en-scène maintained by him for fifteen years in the pair of playhouses which he conducted in Berlin—at first the Neues and the Kleines, later the Kammerspiele and the Deutsches. This ancient Viennese theatre, usually called the Theater in der Josefstadt, was built in 1788 when the baroque art of the Austrian empire had passed its height. Its history is full of notable names —Mozart, Beethoven, Grillparzer, Kreutzer, Raimund, Weber—as well as periods of drab failure. This old print shows the auditorium and stage during a performance in 1850.

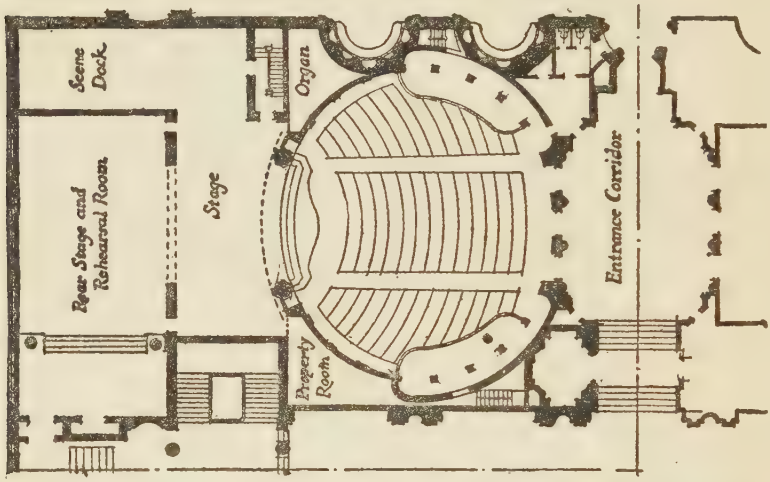
Reinhardt's.

The Theater in der Josefstadt has been completely renovated and redecorated for Reinhardt's occupancy; yet the architect, Carl Witzmann, has made an assiduous effort to retain throughout the auditorium the dress of its best period. The decorations are characteristically baroque; the colors, red, white, and gold. The illumination during the entr'actes comes from a crystal chandelier almost in the center of the house. At the beginning of each scene it is raised to the ceiling. The seating capacity of the theatre, including the two rows of boxes common to the older theatres, is about six hundred.



Plans of the Berliner Volksbühne. The form of the auditorium is typical of the latest practice in continental and American theatre design. The large amount of stage space, in proportion to the auditorium, however, is unfortunately not typical of American theatres. The second-floor plan is included to illustrate the general arrangement rather than to show the balcony form, which is neither typical nor particularly good.

an interior setting, the side walls of the room represented, instead of being set at right angles to the back wall, as is the case in most rooms, are set at an angle corresponding to the sight lines drawn from the extreme right and left ends

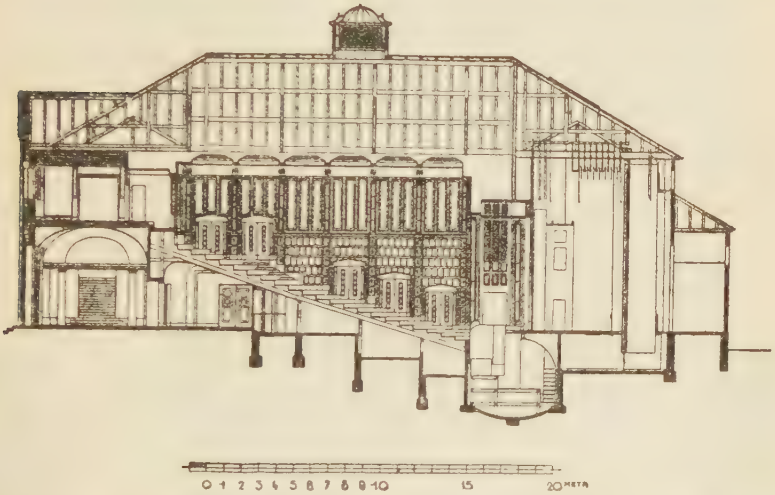


Plan of the theatre at the Carnegie Institute of Technology, Pittsburgh. The sight-lines from the sides of the auditorium are badly distorted, evidently to preserve the novel architectural effect of an elliptical room. By drawing lines from the outmost seats in the first five rows, it can be seen that spectators there will be shut off from any view of more than half the stage space. The one outstanding feature here is the large amount of space given to scenery storage-room and green-room.

of the last row of seats. This is purely a convention, required by the shape of the playhouse, and pardonable on the ground that it is less irritating to look at a distorted room than to be unable to see its corners.

At all events, this form of auditorium affords a higher visibility than did the old horseshoe shape. The most note-

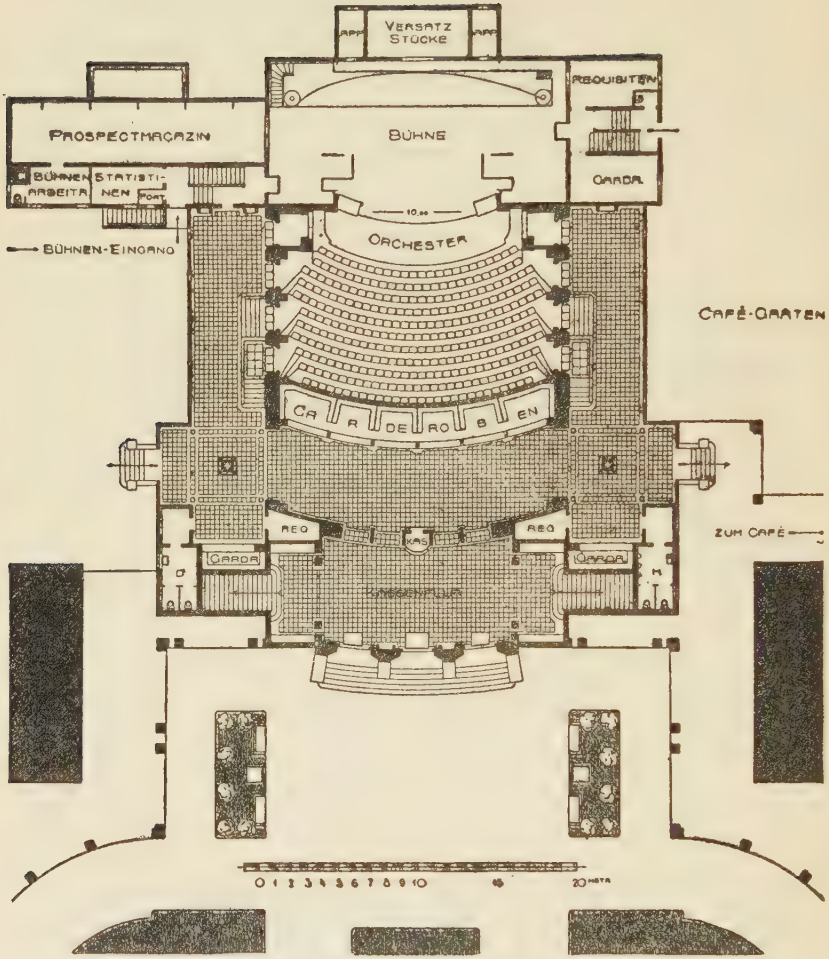
worthy move toward the adoption of this type of seating was made by Richard Wagner in the construction of the Opera House at Bayreuth. Here the auditorium is in the shape of a fan or blunt-nosed wedge, with the stage at the narrow end. The most approved type of modern auditorium follows this form to some extent. In such theatres



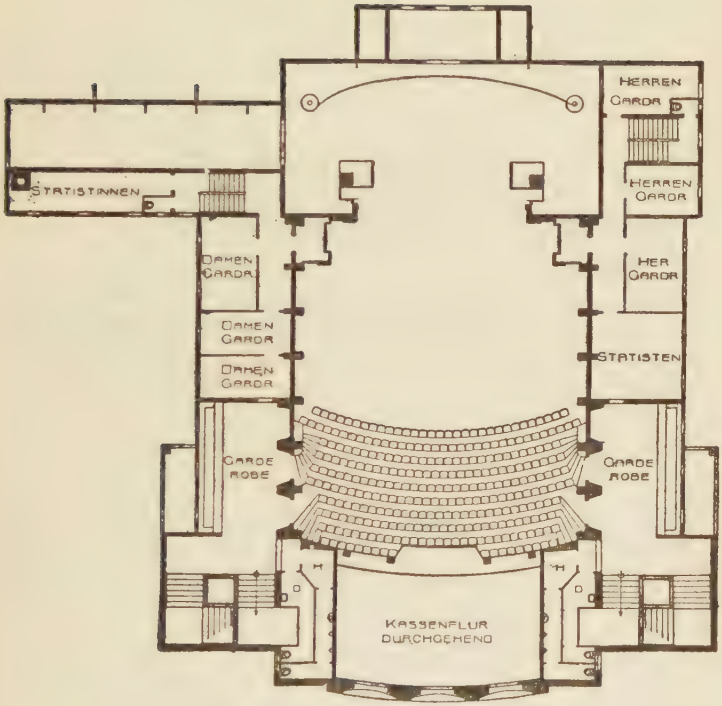
A section showing the arrangement and structural features of the Munich Art Theatre.

as the Künstler Theatre in Munich (Littmann), or his Prinz-Regenten Opera House, this plan is developed.

The general plan of the best modern American theatres is rectangular with the side walls converging toward the stage, beginning at a point about two-thirds of the way from the back. The seats are in concentric rows following a curve drawn from a center approximately at the middle of

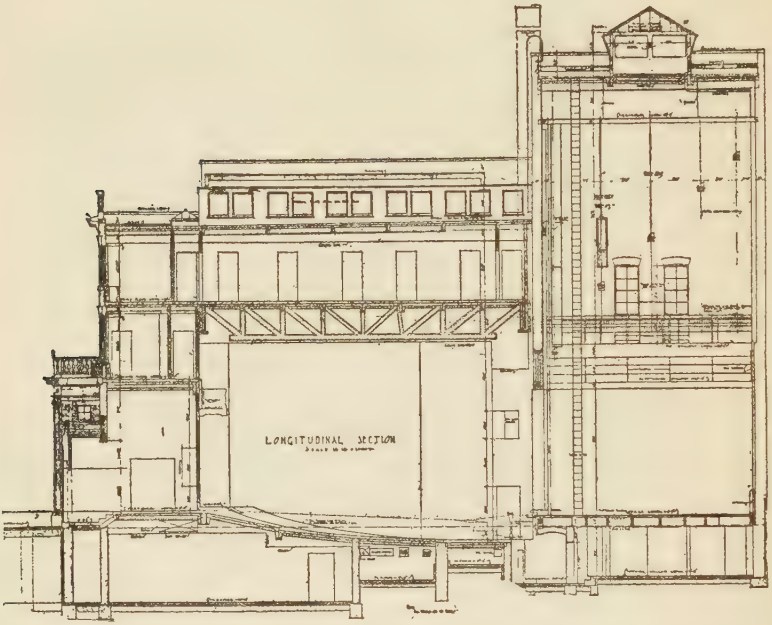


First-floor plan of the Munich Art Theatre. Note that the seats shown here form only a part of the main floor section, as indicated in the plans on the page opposite. Max Littmann, Architect.



The second-floor plan of the Munich Art Theatre. It should be noted that the seats here are not a balcony but a continuation, on the same floor slope, of the seats shown in the plan on the page opposite.

the back wall of the stage. The back wall of the auditorium follows the curve of the seats. The Little Theatre in New York is built on this plan. Where balconies are included,



Section of the Little Theatre, New York, showing clearly the relationship of the stage, auditorium and other portions of the building. The dressing-rooms are above the auditorium and are reached by both stairs and elevator. It is a notable example of the best contemporary American practice in auditorium arrangement. Harry Creighton Ingalls and F. B. Hoffman, Jr., Associate Architects.

they have only a slight curve, approximately the same as that of the orchestra seats.

It is a common fault of school auditoriums that the seating is extended to the right and the left of the stage, so

that a considerable number of seats are valueless for seeing. They preserve, also, for no known reason, other than that it has been the theatre practice, the apron, projecting far beyond the line of the proscenium arch.

A second requirement for assuring direct sight lines from every seat to the stage is an inclined floor. In many cases, this appears an insuperable difficulty. Auditoriums which must be used as gymnasiums or dance halls require level floors. Often, then, the stage is elevated at a greater height from the floor than usual, in the belief that this device will overcome the lack of an inclined floor. On the contrary, it merely makes the spectator tilt his head at an uncomfortable angle, makes the players appear preternaturally tall, and, as they move toward the back of the stage, conceals the lower part of their bodies. The best height for a stage, whether with inclined or flat auditorium, is three feet, nine inches.

A number of means may be used to provide an inclined floor when performances are to be given in a hall which must be used for many purposes. In Copley Hall, Boston, movable risers were installed, each row of seats being lifted about six inches above the row in front. This scheme has the advantage of being the least costly at the beginning, but this consideration is outweighed by a host of disadvantages. The trestles and platforms occupy a large storage space when not in use, they are not a hundred percent safe, and they emit a squeak with every footstep. Moreover, they increase, to some degree, the fire hazard.

Far more ingenious and needing no storage space is the

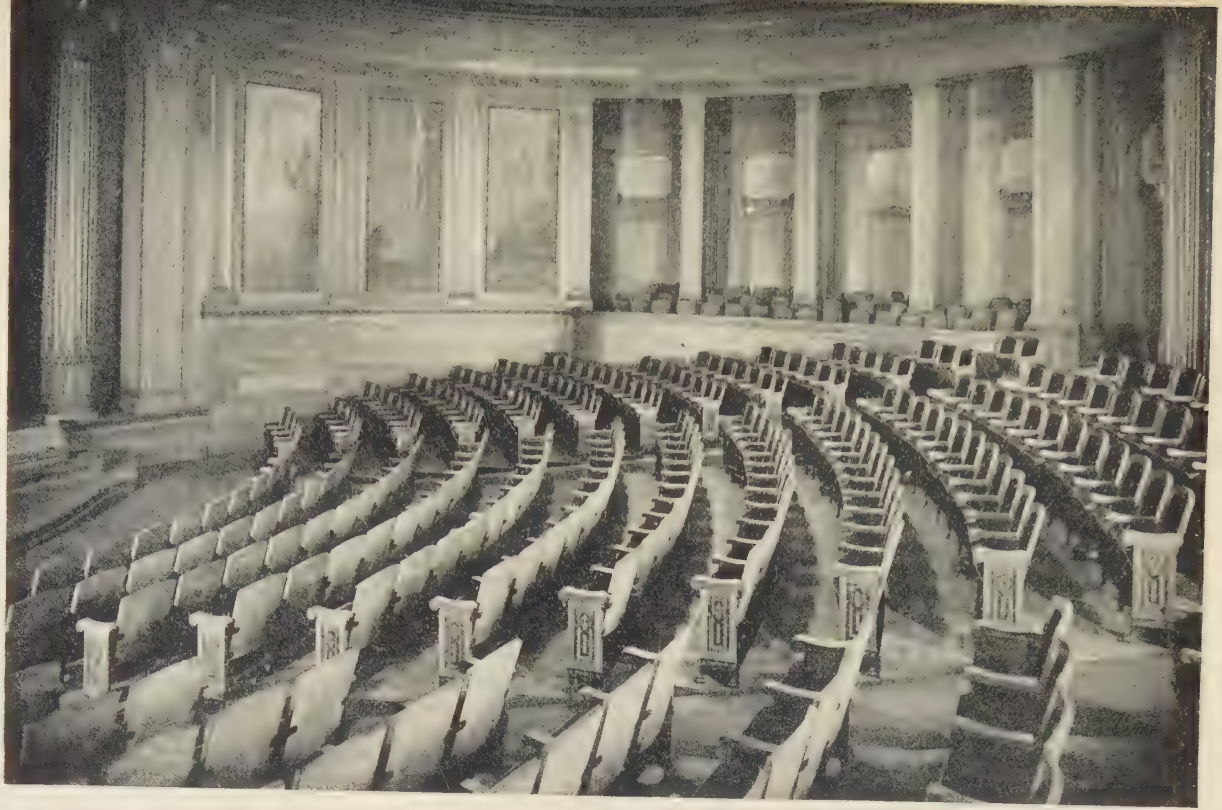
device employed by Laurence Ewald in building the Little Theatre of the Artists' Guild, St. Louis. The theatre occupies a wing of the building used ordinarily as an art gallery, and has a level floor. When performances are to be given, the theatre seats are bolted to the floor, and the back half of the floor, which is built in one piece, hinged at the middle of the auditorium, is lifted at the rear by a four-ton hydraulic jack until a pitch of about one inch per foot is obtained.

Mr. Ewald has provided me with the following account of the construction of the floor:

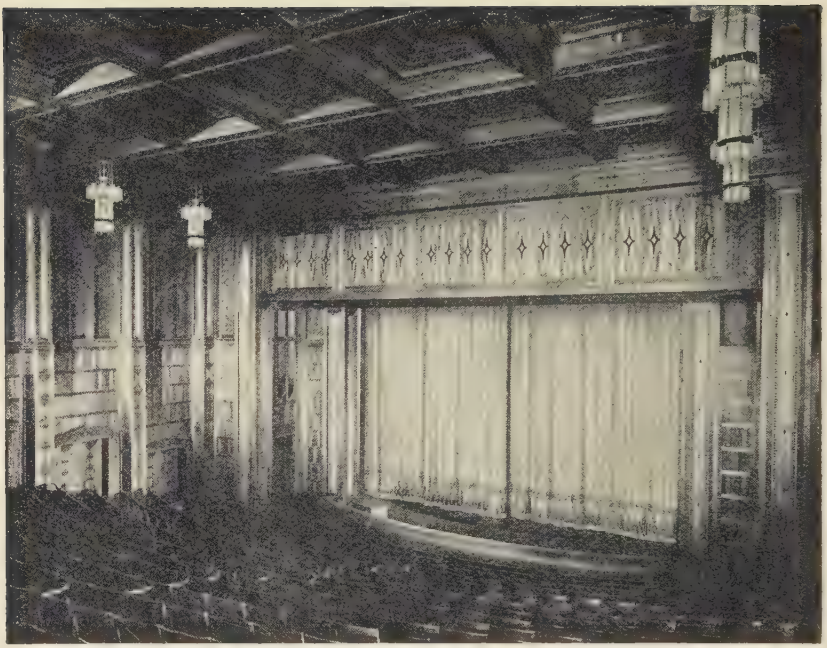
"The movable part of the floor consists of a floor-bearing structure of steel which extends from a hinge half-way between the back of the house and the stage, and parallel with the front of the stage, to the back of the house.

"This structure is made up of four I-beams at right angles to the front of the stage, and another I-beam attached to them at right angles at the back end of the house. In the cellar, immediately beneath this cross beam, is placed an ordinary four-ton hydraulic jack, which, when operated, revolves the back floor structure on the hinges at the middle of the house. When the floor has been raised thirty inches, four legs suspended from the four I-beams drop of their own weight into position and support the load, and the jack is removed."

Had it not been for the structure of the room under the auditorium, Mr. Ewald would have constructed the *entire* floor on a steel frame, as described above, and balanced it on an axle at the center, where the hinges now are. With



Auditorium of the theatre at the Carnegie Institute of Technology, Pittsburgh. This is an admirable example of dignified decoration, uniform floor slope, and generously spaced seats; but the auditorium is too wide to secure adequate sight-lines from all seats. (See plan on page 18.)



Auditorium of the Munich Art Theatre. The plates on this and the following pages, and the plans on pages 19-21, illustrate the interior and exterior appearance, as well as the structural features, of a modern European theatre which comes close to being a model for architects everywhere. Above is a view of the auditorium as seen from a point near the boxes at the back. The decoration in paneled wood (for acoustic reasons), the absence of proscenium boxes, the uniform slope of the auditorium, and the simple decorative curtain, are characteristic of the best contemporary European practice. (The photographs are reproduced by courtesy of the architect, Prof. Max Littmann.)

suitable space under the front half of the floor, it could have been tipped on its axle, depressing the front and elevating the back, giving an incline to the entire auditorium. Built thus, the floor would require no jack and would be amply supported at three points; or, with the understructure built in the form of a truss, the floor could be made to rock on the apex of the truss. With this arrangement, the front half of the floor would have support along its entire length.

Another device, proposed for a great municipal auditorium in a western city, will not so readily commend itself for general use, because of the great initial cost and because of the depth of cellarage required under the auditorium. Here the entire floor was to make a semi-revolution. On one side of the revolving plane was a smooth flooring; on the other, seats were bolted. When the building was to be used as a theatre, the side with the seats was turned uppermost and held at the proper pitch. When the hall was used for a ball or for a dog show, or any function needing a level floor, the smooth side was turned up and secured at a horizontal position.

When the floor can be built with a permanent slope, either a simple incline or an incline in the form of a parabolic curve is used. The latter form is preferable.

In many places the fire laws limit the pitch of the floor to one inch per foot. With rows of seats spaced at the legal minimum of thirty-two inches this does not give enough clearance for the people in each row to see over the heads of those in the row in front. For a decent degree of com-

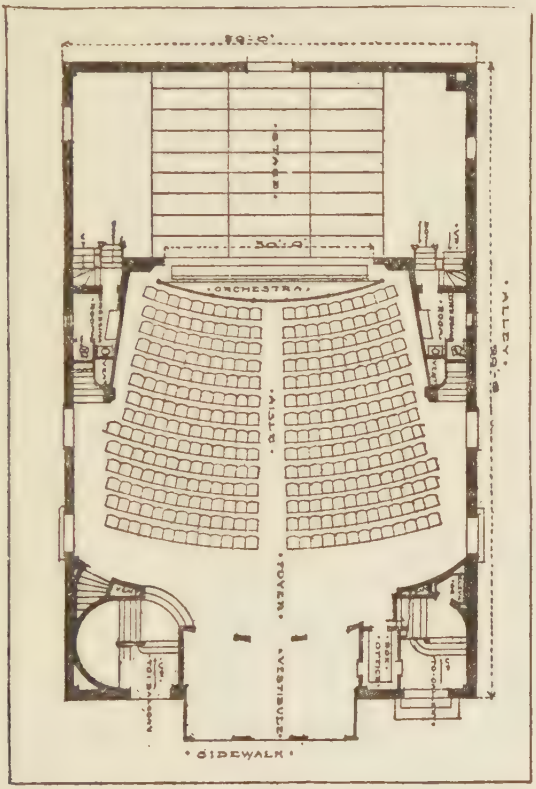
fort, a little seating capacity should be sacrificed, and the rows spaced thirty-six inches apart.

If possible, there should be a gradient of two inches to the foot, giving a difference of elevation between rows of six inches. If the law prevents the two-inch grade, the same effect can be produced by "staggering" the seats. That is, the seats of alternate rows are set in direct alignment, while the intermediate rows are set half a seat-width to the right or left. Thus spectators will look between the shoulders of those immediately in front of them, and will be able to see over the heads of those in the second row in front, who, by such an arrangement, will be sitting in a direct line with them. There will thus be a six-inch difference between each two rows of seats.

Beyond all these considerations of adequate sight lines, however, there is another requirement far more important, far less well understood, even in the light of any guiding or misguiding tradition, by the average architect. That is the requirement of good acoustics. Until quite recently, this was left wholly to accident. Buildings were erected, and the acoustic properties were tested afterwards. If they chanced to be good, the owners were to be congratulated. If they were bad, great sums were spent stringing piano wires, or nets of raw silk, or padding the walls. And then, quite as often as not, the acoustics remained bad.

The late Wallace Sabine, however, demonstrated that it was possible to predict the acoustic properties of a proposed structure with scientific accuracy, and to forestall defects by structural modification. In *The American Archi-*

tect, Dec. 31, 1913, Professor Sabine described the experiments by which the causes of the acoustic difficulties in the New Theatre (now the Century) in New York were dis-



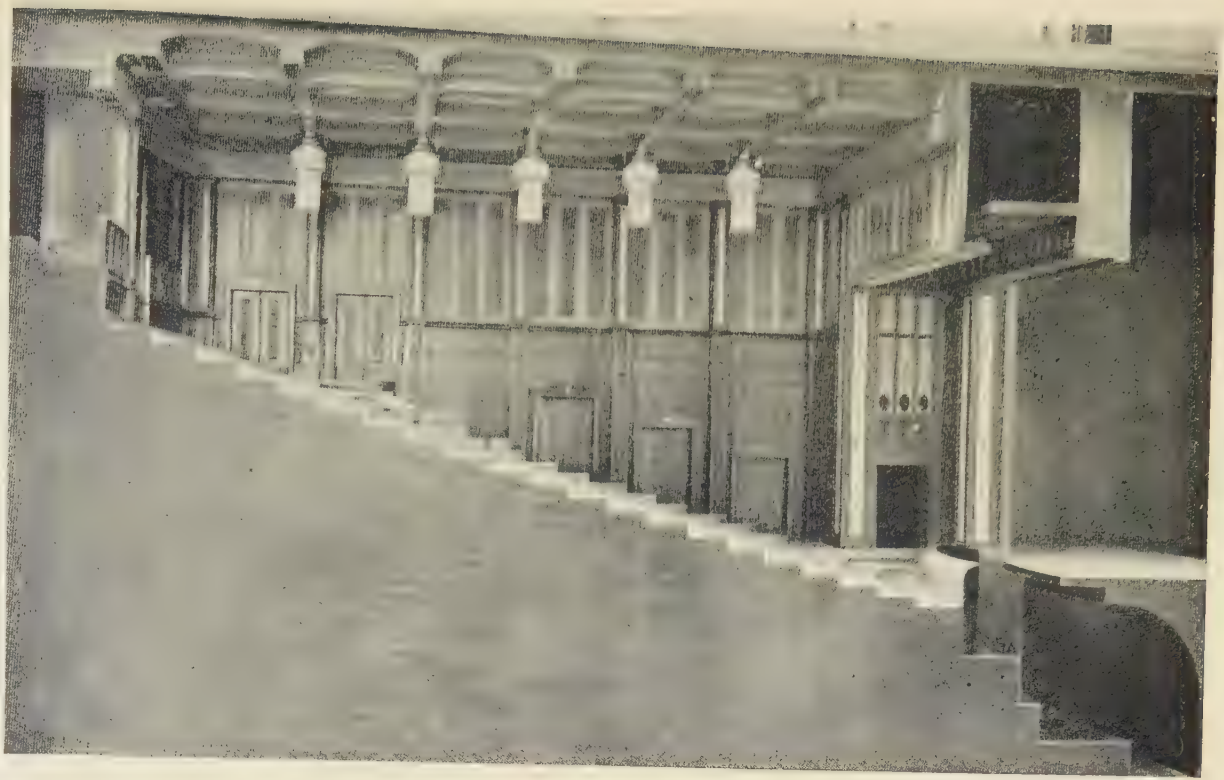
Plan of the Thirty-Ninth Street Theatre, New York. An example of good planning for sight-lines, illustrating an auditorium with centre aisle.

covered and overcome, and the methods which he employed in helping plan a number of the theatres designed by C. H. Blackhall, perhaps the most experienced theatre architect

in the United States. This paper and others by Professor Sabine should be read by any architect who contemplates building an auditorium of any sort. The matter is too vital to be left to a hit-or-miss chance of success.

With an auditorium from every part of which the stage can be seen, from every seat of which all the words of the actors can be heard, there will be little fault to be found. Its comfort, its ventilation, its isolation from street noises, its protection against fire—these are matters which need not be treated here, and which have been written of elsewhere more adequately than I could write of them. As for its decoration, there are no rules to govern that. If the designer has bad taste, there is no help for it, except to avoid him. If he is an artist, let him exercise his art on the interior of the auditorium and forget the sort of thing that has traditionally adorned theatres and wedding cakes.

But, most of all, let him talk with the artist, if there should luckily be one, who is going to work in the particular theatre, and learn from him the sorts of play that are to be done, and the æsthetic of the group that is to present them, and so find the atmosphere the auditorium should evoke. From then on, his task is one of high creation.



A cross-section model of the Munich Art Theatre, showing clearly the arrangement of boxes, auditorium, exits, stage, hidden orchestra pit, double proscenium, etc.

Entrance of the Munich Art Theatre

Chapter 3

THE STAGE PLAN

We are accustomed to regard as the stage of a theatre that part on which the actors appear, immediately behind the footlights, bounded, right and left, by the proscenium arch. As a matter of fact, this is a very small part of the stage. From the construction of many school stages and many of the stages of the little and experimental theatres, I am convinced that this misconception really exists. It is true that many little theatre groups have been obliged to choose between a cramped stage and no stage at all. On the whole, the work they have done, in the light of their limited equipment, is nothing short of amazing.

One well-known little theatre director has declared to me that he values these inadequacies because of the ingenuity required to overcome them. And I imagine that very frequently admiration for this sort of ingenuity passes current for the evaluation on its own merits of work done in these theatres.

No director could be hindered, however, by having excellent facilities at his command. His imagination, instead of visioning means of overcoming too low a roof to his stage or the lack of off-stage space, would be free to interpret the matter of the play itself. It would be a great pity to

lose the work of many earnest groups who have been presenting plays in remodelled dwellings, saloons, or stables, with what appear to be hopelessly inadequate stages. But if a building is to be erected for the purpose of housing a theatre, it will mean greater freedom for the artists (in fact or intent) who are to occupy it, if they are given every facility that foresight can provide.

The stage, properly speaking, is about five times as large as the part of it that is visible to the audience when the curtain is raised. The spaces to right and left of the proscenium arch should equal the center space within the proscenium. Then there is the space above the stage, the space under the stage and the space required adjacent to the stage for dressing rooms, shops, etc.

Dimensions for practically all of these spaces can best be derived from the dimensions of the proscenium arch. The width of the opening generally is equal to half the width of the auditorium at its widest part. It may be somewhat less or somewhat greater, but it is well to establish a minimum of twenty-four feet for the width of the opening. Less than this will not give adequate space without serious crowding for the presentation of scenes with more than a very few people.

In height the proscenium should be fittingly proportioned to the width, with a minimum of about twelve feet in mind. A stage too low and too narrow will throw the human figure out of proportion to his surroundings on the stage. Let us assume that we have a stage with a proscenium opening twenty-four feet wide and not less than twelve feet high.

The aggregate off-stage space right and left should then equal about twenty-four feet, making the total width of the stage-house forty-eight feet. The depth of the stage should be not less than twenty-four feet. The height of the stage, from floor to "rigging loft" should be not less than thirty-six feet. The cellar under the stage should be not less than ten or twelve feet deep. This is merely a rough guide, using the measurements of the proscenium as index.

Claude B. Hagen, construction engineer for the Century Theatre in New York, suggests a "rule of seven" for the derivation of these dimensions, making all of them multiples of seven. The following table gives his measurements for stages of various sizes:

Proscenium width	28 ft.	35 ft.	42 ft.
Proscenium height	Seven feet less than width		
Height of loft	56 ft.	63 ft.	70 ft. to 84 ft.
Height of fly-gallery floor	28 ft.	35 ft. (7 ft. back of proscenium)	
Width of stage	42 ft.	56 ft.	70 ft.
Depth of stage	21 ft.	28 ft.	35 ft. to 42 ft.
Cellar	14 ft.	21 ft.	
Distance between border lights	Seven feet from center to center		

These measurements, while customary, are hardly ideal, and are generalizations from the more or less arbitrary dimensions imposed by high land values. It goes without saying that however small a theatre is, its stage should be as large as the plot on which the building stands will allow.

The off-stage space at the sides is particularly important. Without it, entrances to the scene are cramped, there is no place to pack furniture and scenery for other acts than the one in progress on the stage, and there is no place for the actors to await their entrances. Such space is needed, often, for the suggestion of other rooms than the one before the audience, and an important part of the lighting of the scene is done from the sides.

Next in importance is the space above the stage, the "flies," in the technical vocabulary of the theatre. In this space, above the line of vision of the spectator, much scenery is hung until needed, lighting units are suspended, and with good overhead space effects of height can be produced and ampler places revealed than that in which the audience sits.

The cellar under the stage is of especial importance where the off-stage spaces at the sides are cramped. It is used for the storage of scenery and furniture, for stage machinery and for entrances from a lower floor (with the aid of traps), and it often provides passage from one side of the stage to the other during the progress of a scene that occupies the entire depth of the stage. In some theatres, a part of the stage floor may be lowered by an elevator, and properties or furniture disposed of during the changes of scene, thus preventing crowding of the stage-house itself.

Hardwood should never be used for the stage floor. The architect of the excellent Arts and Crafts Theatre in Detroit, in his desire to use only the best of building materials, specified a stage floor of maple. As a consequence, it is

Auditorium of the Artists' Guild Theatre, St. Louis. This little auditorium is made useful for both dramatic productions and art exhibitions by means of an ingenious device for tilting the floor, described on page 24. Above is the view toward the balcony, below the view toward the stage. Laurence Ewald, Architect.

The Neighborhood Playhouse, New York. This building is one of the most satisfying examples of recent theatre design in America, being free from overdecoration and admirably fitted to its purpose technically. Harry Creighton Ingalls and F. B. Hoffman, Jr., Associate Architects.

almost impossible to support scenery by the use of stage braces, screwed to the floor with a stage screw or "peg." Soft wood into which the pegs bite easily is the only sort to use.

It is particularly important in small theatres that the stage walls be as unbroken by entrances as possible. At least two there must be: a large high door, opening to an alley or street, by which scenery may be brought in and taken out, and a small one, a stage entrance for the people of the theatre. It is well so to contrive the building that this one door gives access to the stage from the dressing-room corridors, shops, cellar, stairs, street and front of the house. With many doors opening on the stage, it is difficult to find space for the stacking of scenery without blocking them. It is often desirable to have one dressing room very near the stage or opening immediately upon it, not for the use of the star, but for the player who may happen to have the quickest change of costume.

Stages intended for the housing of large productions and traveling companies should include also a fly gallery, built out from one of the side walls of the stage at a height of not less than twenty feet from the floor. The ropes by which drop curtains, ceilings, and "frame-pieces" of scenery are raised and lowered are operated from this floor and are tied off to pins fastened in the gallery railing, technically known as the pin-rail. In smaller stages, of no great height, it will save space, construction costs and operating expense to have the pin-rail at the floor level.

Before discussing the equipment of the stage in detail, I

wish to digress for a moment and consider the provisions to be made for the work that is done out of sight of the audience—by the carpenters and property men, the seamstresses, the electricians, and the actors before they are ready to appear before the footlights.

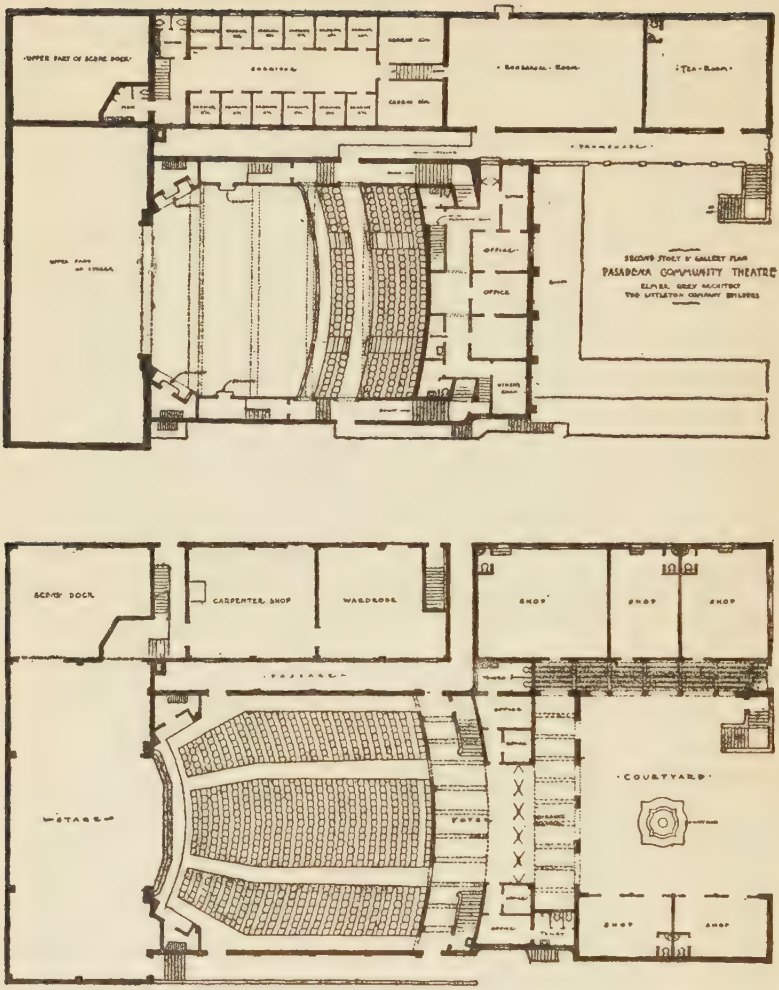
The Buddhist Temple Stage in Japan.

Chapter 4

PROVISION FOR BACK-STAGE WORKERS

I HAVE noted in an earlier chapter that the architecture of the theatre is always governed by the function of the drama performed in it. The use to which the stage is put determines always the shape and style of the auditorium. There is no doubt that some great change is soon to overtake the theatre; the drama will assume a new form, demanding a new mode of presentation, and so a new theatre. Presently I shall discuss what forms this new theatre may assume, but for the moment it is enough to observe that it will be marked by a closer bond, one way or another, between the audience and the players, between the audience and the play.

For a long while, the theatre has shrouded itself in a sort of pseudo-mystery. "Back-stage" has had the lure for the layman of a hat from which rabbits are drawn by a conjurer. Of course, under inspection, such a hat is found to be as empty as any other, bearing even, in most cases, the mark of a respectable maker. And the inspection deepens the mystery. The stage has shunned this sort of scrutiny, because our drama of to-day and our theatre live mostly by "effects." And if the effect is stripped of wonder, the theatre is almost as good as dead. What a sign of weak-



Plan for the Pasadena Community Theatre, which includes perhaps the most complete plant for amateur production in America. With its dressing-rooms, scene docks, work shops, and rehearsal space it provides more efficiently for the work of production than all but a very few of our largest professional playhouses. (Elmer Gray, Architect.)

ness this is! If the snowstorm is seen to be bits of paper shaken out of a bag, and if it is found that the imitation wind is produced by the scraping of paddles on canvas, the public will lose interest in the theatre.

And the people of the stage! How hungrily necks are craned for a glimpse of the popular actor or of the beautiful actress, should one pass in a hotel or on the street. They inhabit that mysterious, unexplored back-stage. And a

Cross-section of the Pasadena Community Theatre.

clever manager will encourage this sort of curiosity by advising his people not to show themselves in the street, except unavoidably. The matter of seeing the actors close may be dismissed with a quip—they might be found respectable upon acquaintance, or, more likely, dull. But the truth about the back of the theatre is the truth about the conjurer's hat—there's nothing there to see, except the pitiful little bag of tricks, the snowstorm and the wind. There is not even the maker's label. But this emptiness is not all, for as with the hat, it's quite engrossing while the rabbits are

there. The worst of it is that it is so poor, so mean often, so dirty, so cramped and littered, to the last, dark cranny, that we wonder how the actor-rabbits endure it all and keep their fur so white.

A rudimentary shame on the part of the managers, and a very human pride on the part of the actors, have helped to keep these matters from the theatregoer. Out front, there is warmth, light, comfort, elegance. The spectator is lulled into forgetfulness of work, and the play casts its spell over him. But a glimpse of the wretched barrenness of the dressing-room or shop would make short work of his peace of mind, just as a knowledge of the tricks sheers them of illusion.

These things are becoming known, because the bond between the spectator and the theatre-worker is already being formed. When it is full grown, such facts will not be discovered; they will no longer exist. For two movements that are bound to affect the theatre of the future are bringing the lay public clambering over the footlights and crowding in at the stage door. One, the Little Theatre Movement, is almost altogether a lay insurgency. In scores of communities, it has made its way; tradesmen, students, clerks, mechanics, people of leisure and working people with a little leisure, have come together and in a short time have plumbed the silly little mysteries of back-stage, and have brought into their theatres a little bit of the real Mystery of life and art that belongs there. And the more extensive, democratic Community Drama movement is making play-actors and theatre-workers of thousands who have here-

tofore been auditors. There will always be a professional group of artists of the theatre, but in their theatres there will be a close understanding and perhaps a physical connection between the audience and the stage; in the great, popular theatre it is conceivable that there will be very little distinction between the auditorium and the stage. It may be that they will be interchangeable or be one and the same. Then, it is certain that the conditions of comfort and convenience that apply to the one shall apply fully to the other, that the actor shall be as well cared for in the theatre as the public.

Let those who are building to-day look to this: Visit the dressing-rooms, see the workplaces of the other workers of the theatre—the carpenter, electrician, property-man, and wardrobe workers. Consider these workplaces, not only in comparison with the front of the house, but as fit places for human beings to spend as much as an hour a day. Consider them as places where work that should have in it joy and beauty may develop.

The community theatres that are going to be built within the next few years are bound to be a blessing to those who have access to them. But, for the most part, their projectors and builders are laymen, knowing little of the vast work of preparation that must be done before a play is ready for an audience. Where the commercial theatre builder does not care how the actor and the theatre mechanic fare, the lay builder is a little likely to overlook their existence. I have seen dozens of clubs and schools, with fairly adequate stages and auditoriums, but with no more than two small

dressing-rooms, one for men and one for women. I have seen several with no more than one, originally intended for a closet but set aside as a dressing-room when it was discovered that something of the sort is indispensable.

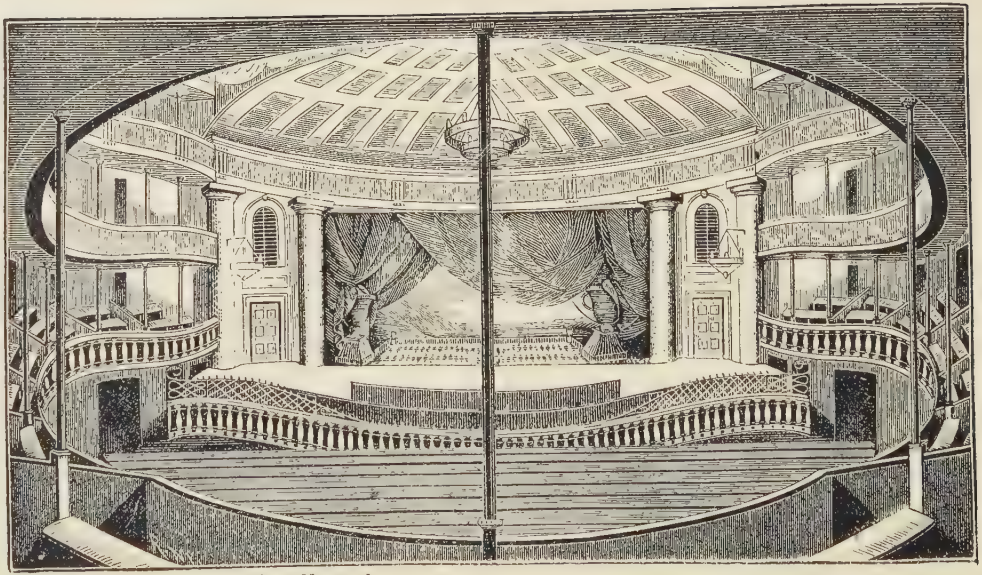
Aside from the fact that the players and the workmen are human beings, quite often of the same tastes and breeding as those who occupy the front of the theatre, they have a long and exacting work to perform, most of which can be done only in the theatre. And their domain is the part of the theatre behind the proscenium line. The actors must rehearse for several weeks before the play can be acted. They must be in the theatre some time before the curtain rises on the play and they leave it some time after the play has ended and the audience has gone home. For they must dress and "make-up," and should be allowed a little while to shake off John Smith and enter into Hamlet. There is, moreover, scenery to be built and painted, furniture and properties to be made, lights to be arranged, effects to be devised, costumes to be cut, fitted and sewed.

How should these activities and these workers be taken care of?

First, the actors.

For their rehearsals, first of all, the stage should be used. If the stage is otherwise occupied, with scenery, or with the rehearsals of another production, as it often is in busy theatres, there should be another place in the same building where rehearsals can be held, a room with as large a floor as that of the stage proper. But, as often as possible, the stage should be used for rehearsals.

In the old theatre at Drottningholm, Sweden, many sets of scenery from the eighteenth century stage have been preserved. Here we are looking over the prompter's box and past the forestage and wide proscenium arch into a typical "palace setting." The flat wings at either side served as interior or exterior columns depending on the nature of the back drop—in this case a view out of doors. Garrick acted against settings of this sort.



Robert Gould Shaw Collection, Harvard.

The Park Theatre, the second great playhouse of New York, as it appeared in 1805. Note the wide apron extending many feet beyond the curtain, and the entrance doors and the little balconies at each side of the proscenium opening. These features link our older stage with the theatres of Shakespeare, of the Renaissance, and even of Rome.

Provision for Back-Stage Workers

Then, for their preparation to appear in a performance, their dressing and make-up. Dressing-rooms must be provided, sufficient in number to accommodate the cast of the average play without crowding more than two people to a room. Under ideal conditions, each player will have a separate room, so that he can prepare for his performance, mentally as well as physically, without disturbance. The rooms should be not less than eight by ten feet, should each have a window, and should be heated in winter. Against one wall there should be a long shelf or table, about eighteen inches wide. Above it should be a good mirror, with lights so placed that the face of an actor seated at the shelf and looking into the mirror will be well illuminated. Under the shelf, there should be a drawer in which make-up materials may be kept. Each dressing-room should be provided with a washstand and with hot and cold water. There should be a high clothes-closet or wardrobe in which costumes may be hung. Where this is impractical, there should be sufficient hooks to accommodate a number of costumes, and means of covering them with a cloth to protect them from dust. Above the clothes hooks, or at the top of the closet, should be a shelf for hats, shoes, etc.

It is well to provide from eight to twelve dressing-rooms, each large enough to accommodate two persons. In addition, there should be two large rooms, each with space for about a dozen persons, these to be used for chorus, supernumeraries, or players of small parts.

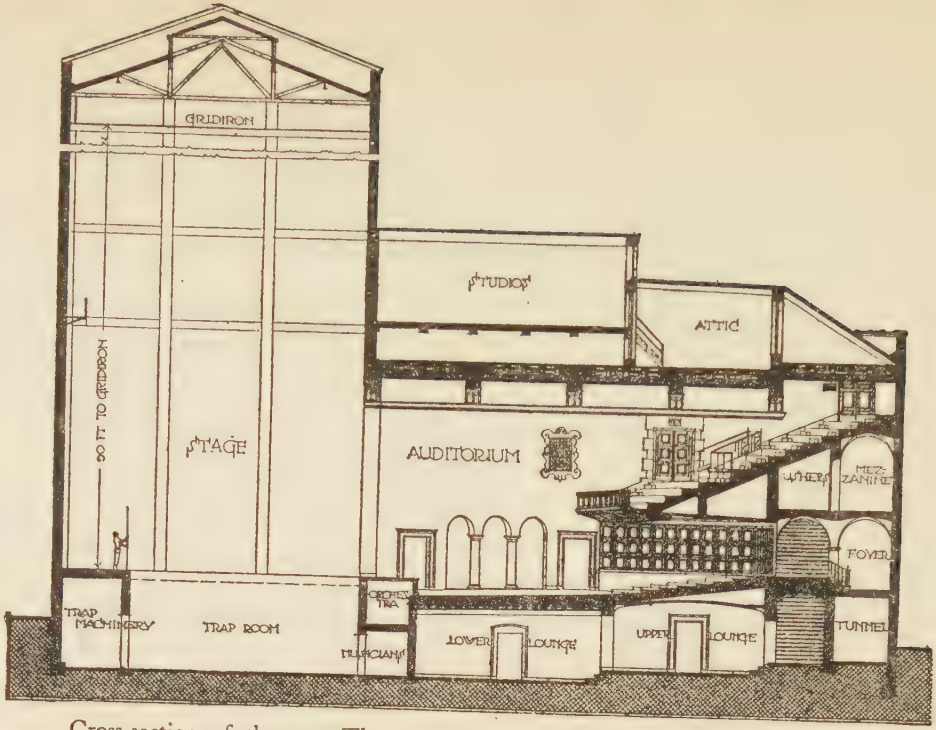
On each dressing-room floor there should be proper toilet accommodations for each sex. Also, the ideally equipped

building will have shower baths. In these days of Dunsany, Hindus and Arabs and Ethiopians may be met in many a town en route from the little theatre to their homes, there to wash themselves white.

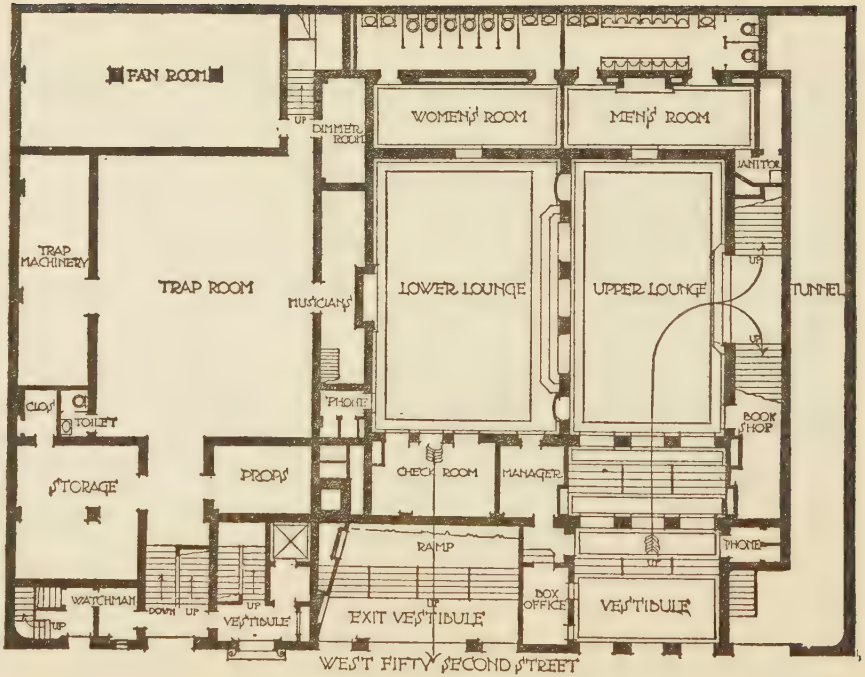
It has been noted that, to preserve the unbroken wall space of the stage as far as possible, dressing-rooms should not open directly upon the stage floor. In many theatres, they are ranged off galleries above the stage. On the whole, this is inadvisable. A dressing-room door, inopportunely opened, will let a beam of light fall upon the stage, often spoiling the lighting of a scene. The slamming of doors, sound of voices, and other noises are almost unavoidable. And the argument usually advanced for so arranging dressing-rooms—that the actors can hear what is going on on the stage and thus be in time for their entrances, is fallacious. This very fact breeds in them a confidence that makes them careless, and they are more often late than if they were required to wait for their cues on the stage.

One more thing should be provided for the actor, not indispensable, but making for fellowship and comfort—the feature known in German theatres as the Konverzations-Zimmer and in older English and American theatres as the Green Room. This should be a comfortable lounge, furnished more as a room in a home or club than in a theatre, and stocked with books and periodicals relating to the theatre.

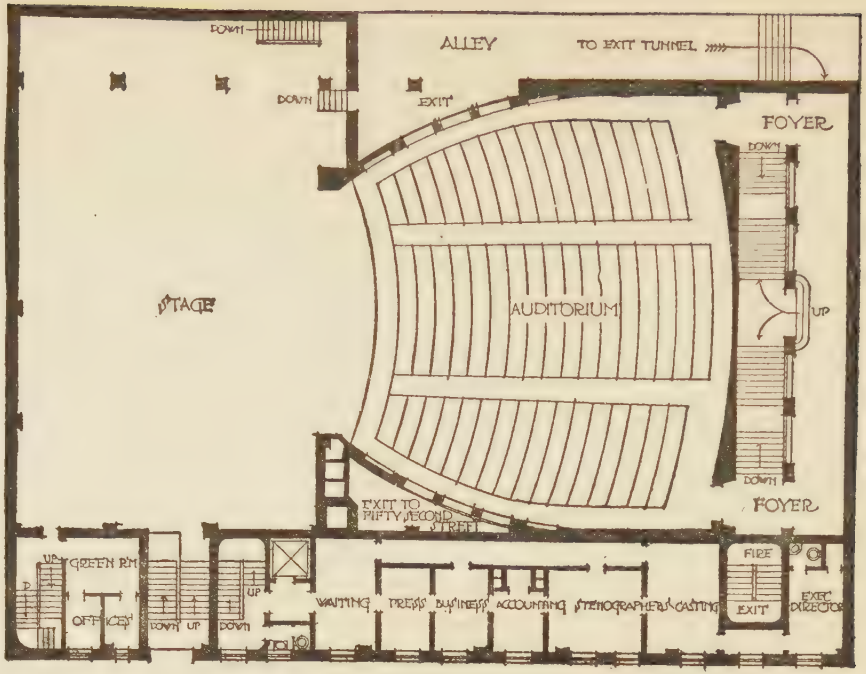
With the actor carefully considered in the matter of cleanliness and cheerfulness back-stage, a new pleasure will come into his work. Likewise, with the other workers of the



Cross-section of the new Theatre Guild Theatre, New York, showing the raised auditorium.



The entrance to the Theatre Guild auditorium is through the lounge and up a flight of stairs.



Bones and even a definitely marked proscenium arch are omitted in the Theatre Guild Theatre. It has a capacity of nine hundred and fourteen.

theatre. Closest to the actor, perhaps, the wardrobe people. In the ideal theatre two rooms should be set aside for the wardrobe, one for the making of clothes and another for their storage. The sewing room, needless to say, should be well lighted, should have a space partitioned off as a fitting room, should be provided with proper closets in which to hang dresses in the process of making, and should be large enough to allow for a number of seamstresses and a large cutting table. There should be a built-in closet equipped with shelves and drawers in which to store cloths, trimmings, findings, etc., for the making of costumes. For the costume storage room, a loft space that might otherwise go to waste can often be utilized. This room should have long closets, fitted with bars on which dresses can be hung, and should have drawers in which other items of dress can be packed—hats, shoes, wigs, stockings, tights, etc. These drawers should be numerous enough to allow for the sorting out of costumes by colors or periods, and should be properly labelled.

Each of the mechanical departments should likewise have its two rooms, one a shop and the other for storage. The carpenter, if the scenery is built in the theatre, often can use the space under the stage for building. If he cannot build his scenery there, either another place should be set aside or the scenery should be built outside the building. He should not use the stage. It must be kept free for rehearsals. He should, however, have a room in which to keep his tools, draw his plans, and file his ground and framing plans, bills, time-sheets, etc.

Provision for Back-Stage Workers

The matter of storage space for scenery is to be determined wholly by the mount of space at the builder's disposal and the use to which the theatre is to be put. If many productions are to be made, a space should be provided for a scene-dock, adjacent to the stage but separate from it, unless the building is small, in which case a storehouse elsewhere may be used. Scenery should not be allowed to accumulate on the stage. The theatre of the Carnegie Institute of Technology at Pittsburgh has an excellent dock, shown on the ground plan, page 18.

The property department needs a shop for the making of furniture, papier-mâché work, etc., and a storage room in which furniture and other stage furnishings can be stored. Often one large room can be made to do for both.

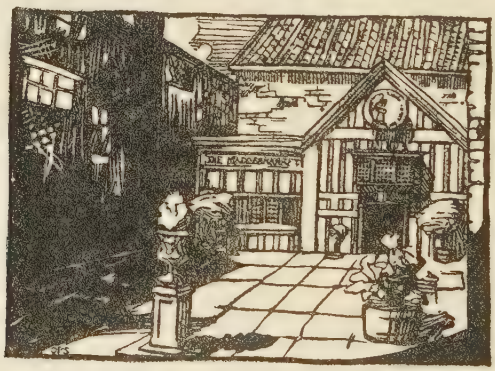
The electrical department likewise must not be overlooked. There must be closets for the keeping of incandescent bulbs, lamp dyes, plugs, connectors, cable, wire, and other electrical hardware, gelatines, color frames, etc. There must be provision in the shop for the dyeing of lamps, testing, repairing, etc.

The property and electrical departments, like the carpenter's, must also be fitted in a sense as offices, for the keeping of electric and property plots, full records relating to past and coming productions, bills, orders, receipts, time sheets, and like data.

It may be objected at this point that these various demands presuppose a large-sized plant with elaborate equipment. As a matter of fact, they apply quite as much to the tiniest of little theatres—even more so, for in such,

proper ordering of space and isolation of separate activities is equivalent, in getting efficiency, to more ample space less carefully sub-divided. For, inevitably, these various kinds of work must be done in the theatre, and the people who do them must find space here or there for their work, and the things they make must be kept somewhere. Unless each job and each product is assigned its proper corner, the building is soon a clutter of stuff, accumulating dust, getting jostled about and broken. Then we are back at the old, dark, dirty theatre we are trying so hard to improve upon. The provisions discussed above, though they are not on the stage, are very much a part of it, and go far toward making it an instrument of precision.

In community buildings and schools, the various workshops, rehearsal room, etc., can often be combined with rooms serving other purposes. In any case some provision for them is quite as important as the open stage itself.



The Maddermarket Theatre, Norwich, England.

Sketch for the exterior of the Pasadena Community Playhouse. The "early California" style not only harmonizes with local tradition and the climate, but permits a most interesting use of a courtyard. In the wings to the right are shops, the income from which will aid in balancing the budget of the theatre. The entrance to the lobby of the theatre is at the back of the court. (See page 36.)

Mott Studios.

The rococo lines of the auditorium of the Pasadena Community Playhouse harmonize well with the old galleon of Alson S. Clark's curtain. The original "early California" style which Elmer Grey, the architect, had planned for the interior, has been somewhat modified in the realization. Under the direction of Gilmor Brown, the playhouse has not only become a centre of civic interest, but one of the most versatile of American Little Theatres.

Chapter 5

THE EQUIPMENT OF THE STAGE

The outstanding point about the stage, apart from the life the actors bring to it, is that it is a machine. It is a mechanical device used to aid in the setting forth of a play, much as a potter's wheel aids the maker of vases, or a mortise and tenon machine helps the cabinet-maker. Perhaps the cabinet-maker is no less a hand-craftsman because he uses the mechanical device to shorten his labor, and it is probable that the vase has a truer form for being turned on a wheel. But cabinets have been made wholly by hand and vases turned without the potter's wheel. There are people who treasure works made wholly by hand above the machine-aided work, however artistic. The theatre once did without the adventitious aids it now employs. Once it was merely a platform set in the sunlight, revealed to the sight of an assembled audience. Many believe that the theatre of the future will be something of that sort, welcoming, however, in addition to or instead of the sun, the more constantly available, controllable and subtly colorable electric light.

But the Greeks had their machines for the revelation of gods, and there is something about *periaktoi*, or revolving pieces of scenery. It is with the machines that the theatre

has concerned itself most of all. Every developed stage has employed an amount of mechanism for the producing of those "effects" which I mentioned in the preceding chapter; and it may be that the theatre always will—one wing of the theatre, the Right, doubtless.

Throughout this chapter I am at a disadvantage because I do not thoroughly believe in the standards which I set up. It is true that I am recommending higher standards than usually prevail in the sort of building which is here considered, higher even than those that prevail in the well-equipped professional theatre. It is true, also, that these recommendations, as viewed in the light of the known and tried methods of play production, are in the nature of reform and improvement. As such, I believe in them. In the light of the theatre of the future, I do not so thoroughly believe in them. But only a revolution in theatre methods can refresh our conceptions of what sort of place this theatre of the future is to be. This matter we shall leave for discussion in a final chapter. I should be ill-advised in recommending to ambitious groups interested in building adequate little playhouses to set aside finally the known and tried methods of play production and the stage they involve, for methods adapted to a type of drama that may not yet exist, for methods that must be evolved only by sensitive and versed artists of the theatre. It is true that many signal new ideas come into any art through workers who do not know or trouble about tradition, young hands who blunder upon valuable innovations through attacking their medium experimentally. For instance, An-

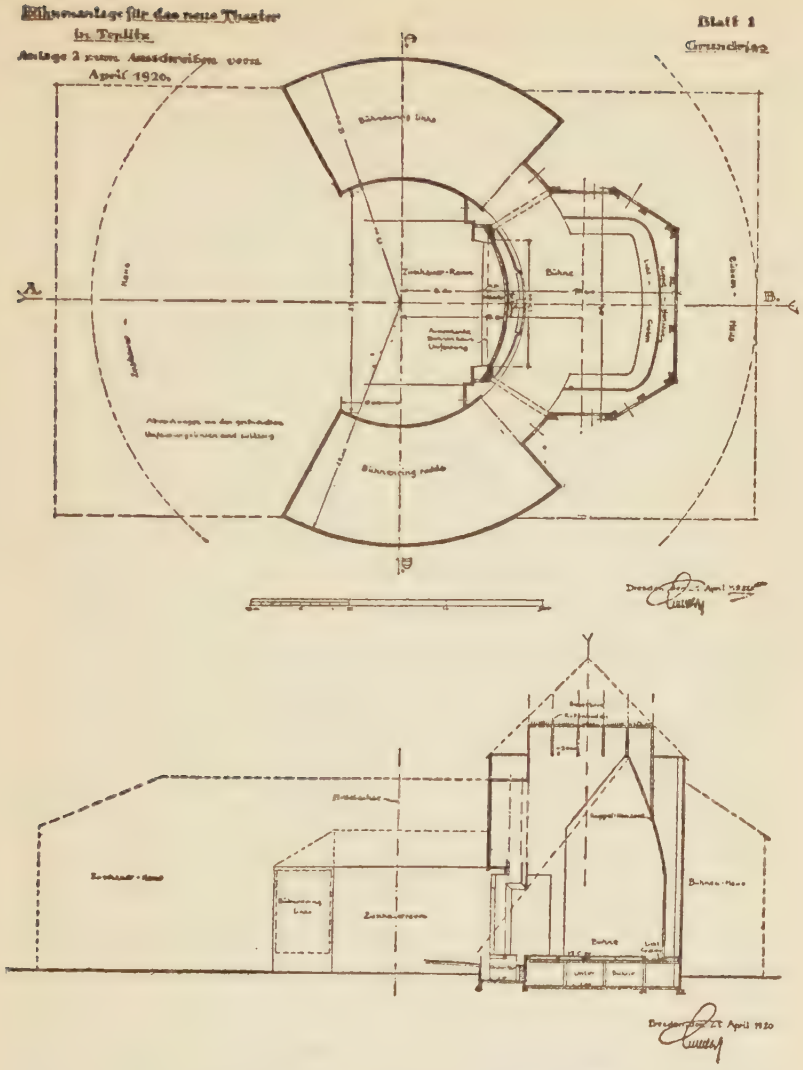
toine, a worker in the gas company of Paris, who began his theatrical career as an amateur, by his daring innovations in the *Théâtre Libre*, renewed the life-force of the French theatre. But, in the main, I believe that the most important revolutionary changes in the stage are wrought by men who are thoroughly versed in the old practice, as was Gordon Craig. If the little theatres and community playhouses continue for the coming generation with a theatre modelled after the best practice of this our day, they may in good season contribute mightily to that theatre of the future to which I referred. Hence, for the present, it is best that I continue in the rôle of reporter, rather than that of prophet.

Of late years, with the advent of the naturalistic or realistic type of drama, the stage has sought more and more illusion, not only in its imitations of the movements and acts of men and women but in its representation of their surroundings. It has tried to become a more perfect machine —more nearly an *instrument of precision*. It may be significant to observe that, although masterpieces of drama gave impetus to the development of the illusion stage—outstandingly the plays of Ibsen—the illusion stage has brought forth no masterpieces. In this country, it may be held responsible for the buzz-saw, train-wreck, or horse-race type of melodrama, a type now happily removed from the theatre by the moving picture with its still higher degree of visual veracity. In Germany, the stage as machine has been developed to an extraordinary degree, and, for the most part, never debauched by exhibitions of effects for their own sake, as in our sensational melodrama of half a

generation ago. I shall discuss a number of these German inventions in a later chapter, but for the present propose to consider the stage as a machine adapted to average demands.

There are two primary demands—that the machine shall be able to do the work demanded of it efficiently and with a minimum danger of breakdown, and that the machine be subject to control. The work of the stage-machine is, of course, the handling of scenery, the illusion-stuff of the present-day stage. This scenery is of two types: pieces that are suspended from ropes (hanging pieces), and pieces that stand on the floor (set pieces). For exterior scenes, the first type includes drops, "borders" representing foliage, leg-drops representing trees, pillars, arches, etc., or sections of wall, house-front, or other flat architectural units, large enough to warrant hanging overhead when out of use, so as to save floor space; and—for interior scenes—ceilings and back walls. The second type includes, for exterior scenes, any low-standing units, such as walls, hedges, fences, tree trunks, "wings" or set-houses; and for interior scenes, the side-walls of the room and very often part or the whole of the back wall.

For the manipulation of hanging scenery, the most important piece of stage machinery is the grid-iron. This is a slatted platform of steel or iron joists, built a few feet below the roof of the stage, just enough below to allow head-room for a man standing on it. Along the center of the grid-iron, on a line at a right angle to the foot-lights, is set a row of blocks and sheaves of a special type, manu-



In America we subordinate the design of the stage of a new theatre to the rest of the house. In Germany they begin with the stage, establish its character, size, position, and submit a memorandum of requirements to the competing architects. Above are the plans of Adolph Linnebach for the stage of a new playhouse equipped with a sliding stage. Because of limited space the rolling wagons and tracks form a horseshoe, almost surrounding the auditorium.

factured for stage use. Equidistant right and left of this center row by half the width of the stage proper (the part of the stage within the proscenium) are other rows. Over these sheaves, ropes are passed. Thus, hanging over the stage parallel to the back wall, in sets of three, are lines to which scenery may be attached. The other ends of the lines in each set are brought together at one side or the other of the stage, so that the three ropes of each set may be operated as one. On the side to which the lines are led is located the pin-rail, either on a fly-gallery or at the floor level. Of each set of three, the line hanging nearest the side from which the lines are operated—the pin-rail side—is known as the short line, the line most remote from it is known as the long line, and the other as the center line. On very large stages, with an opening of forty feet or more, four lines to each set are advisable, not only to bear the greater weight of the larger pieces of scenery required, but also to secure a better trim, or level hang of the scenery.

These lines, needless to say, should be of the best hemp rope, of a weight adjusted to the size of the stage. Half-inch line is the lightest it is wise to use. This rope should be subjected to periodical inspection, to forestall breaking and the falling of scenery, with consequent damage to the scenery, the play, or the actors.

On some grid-irons, the blocks are screwed to the under side of the grid. This is unsafe, as they have been known to tear loose. They should ride the joists, the lines dropping between each two. At least twenty-five sets of lines should be provided.

When a set of lines is not weighted with scenery, sandbags are tied to the loose ends, so that they may be lowered to the floor when needed. Frequently a piece of scenery will be found too heavy for one or two men to raise from the floor. In such cases, counterweights in the form of large sandbags are hung on the part of the lines between the grid-iron and the pin-rail.

The primary purpose of hanging scenery in this fashion is to be able to haul it out of sight in the upper part of the stage when it is not in use. Hence large overhead space is necessary. This system also makes possible the use of unstiffened scenic units, such as drop curtains and borders, which, literally, have no legs to stand on.

In large stages the lines are controlled from a pin-rail on a gallery, built out from one of the side walls of the stage. In smaller stages the pin-rail may be built against one of the side walls on the floor level. This has various advantages—ease of access the foremost, and the saving of a stage-hand, who would otherwise have to remain on the fly-gallery, besides. The advantages to be claimed for the fly-gallery are that its use leaves the stage floor clear of ropes, leaves the side wall clear for the stacking of scenery, and is a valuable vantage point from which to cast light upon the stage.

The stage of the Century Theatre is equipped with a counterweight system that practically eliminates hand-power in the raising and lowering of hanging scenery. To each set of lines is attached a metal case, or container, which rides up the stage wall between tracks. At the top of the stage,

above each container, there is a magazine filled with buck-shot. By an ingenious mechanism, when a piece of scenery hanging in the loft is to be lowered to the floor level, a quantity of the shot in the container is allowed to flow out, so that the scenery outweighs the counterweight and descends. Its descent can be stopped at any point by brakes on the lines. When it is to be raised, shot from the magazine above is allowed to flow into the container until the counterweight outweighs the scenery, and the scenery ascends. The shot that flows to the bottom of the chute is conveyed by an endless chain-and-bucket conveyor to the magazines at the top. Such a system is only warranted on stages of opera-house proportions. There are also systems for controlling the lines by motors; but on the stage of average size, man-power is the safest and most dependable.

Scenery that stands on the floor requires little by way of machinery. Some of it is self-supporting, as are the "wings"—folding, screen-like pieces used to mask the sides of the stage. All set scenery is "framed," so that it stands rigid enough when braced from the back. Part of the equipment of every stage is a supply of stage-braces for the support of such scenery. These are made of hardwood, can be extended to any desired length, have a prong at the top which hooks into a screw-eye fastened to the scenery, and a foot-iron at the bottom which can be fastened to the stage floor by means of a stage screw or "peg." The use of these pegs demands a soft-wood stage floor into which they will

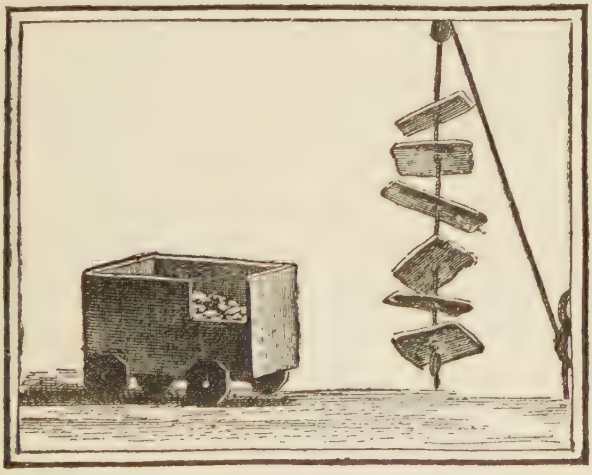
The new playhouse of the New York Theatre Guild, legatee of the Washington Square Players, and the first group of little theatre graduates to reach professional standing and success. C. Howard Crane is the architect, Norman-Bel Geddes was a consultant, and Lee Simonson is responsible for the arranging of the stage equipment and for the lighting system. (See pages 43-45.)

The flexibility of Jacques Copeau's permanent and almost stylized stage at the Vieux-Colombier in Paris—with its balcony, its central archway, and its concrete floor, steps, and forestage—is unmistakably demonstrated in this photograph of the mise-en-scène for the last act of René Benjamin's play *Il faut que chacun soit à sa place.* The scene is the home of a rich business man who has combined with the original French furnishings of the house which he now owns certain curious creations of a contemporary interior decorator. A comparison of other scenes at the Vieux-Colombier will show the possibilities of varied scenic characterization in this stage devised by Copeau and Louis Jouvet.

bite easily. Good stage braces can be obtained from any reliable dealer in stage equipment.

The main curtain of the theatre, if it raises and lowers, is often operated from the fly-gallery. It is better, however, to have it operated from the stage level, on the same side of the stage as the fly-gallery or the pin-rail. The draw type of curtain is always handled from the stage floor. "Travelers" for these curtains can be more cheaply bought than made, and are kept in stock by any stage-rigging firm.

It is well to have the stage flooring built in lateral sections resting on joists that run the width of the stage. When traps are needed in the floor, they can then be cut without difficulty at any point.



An 18th century theatre thunder machine.

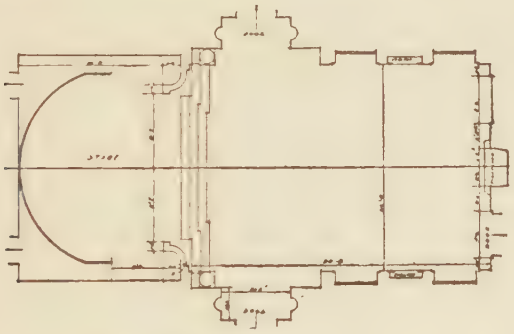
Chapter 6

THE SKY-DOME

THE lighting equipment of the stage, by far the most important of its mechanical attributes, I shall describe later, but I shall treat here of one device, which is structural. It is one of the German inventions for the perfection of illusion to which I have referred, and the only one I recommend to little theatres, far and wide. I recommend it because of the added beauty it can bring into the playhouse, rather than because of its merit as a part of the perfect machine. This is the Kuppel-horizont, or sky-dome.

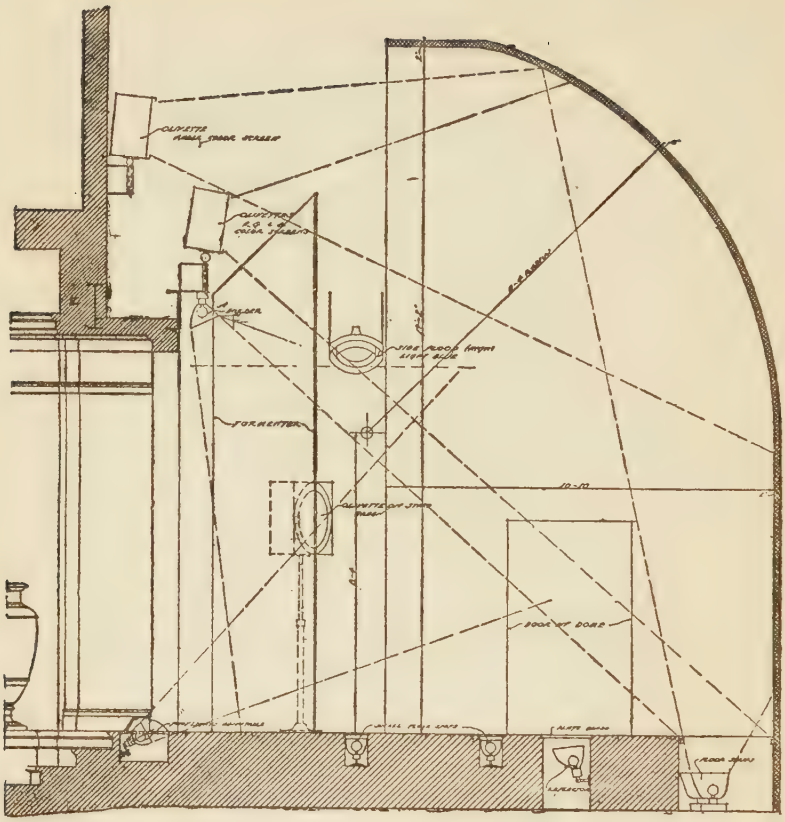
The sky-dome approximates in shape a quarter-sphere, much like the shells commonly placed behind out-door band stands. The base line begins far enough toward the front of the stage and behind the proscenium to be masked from the opposite side of the auditorium, and sweeps around the back of the stage. The back and sides of the dome rise vertically for some distance and then arch at the top toward the front of the stage. The higher the dome is, the less the canopy need overhang the front of the stage; and the less it overhangs, the more grid-iron space is available for hanging scenery. But it will be seen at once that the more dome there is to take the place of the usual hanging stuff, the fewer of the usual tawdry borders are needed.

The late Wallace Sabine, in a series of experiments conducted with a model which Theodore C. Browne and I built at Harvard University, concluded that the quarter-sphere was disadvantageous to the acoustics of the stage and was not required in order to obtain the best results in lighting. He recommended a form flatter at the back and with a sharper curvature at the sides and top.



Plan of the Blythelea Theatre. The cut shows relation of dome, stage and auditorium.

The three first modifications of this device to be installed in little theatres in America were at the Neighborhood Playhouse in New York, at the Beechwood Theatre in Scarborough, and at the Arts and Crafts Theatre in Detroit. The Neighborhood Playhouse "dome" is really little more than a cyclorama built in plaster. It has no canopy overhead, and the ends extend toward the front of the stage only a little distance. The one at the Beechwood Theatre is similarly simplified. But even this plaster cyclorama is a great improvement over the canvas cyclorama in its



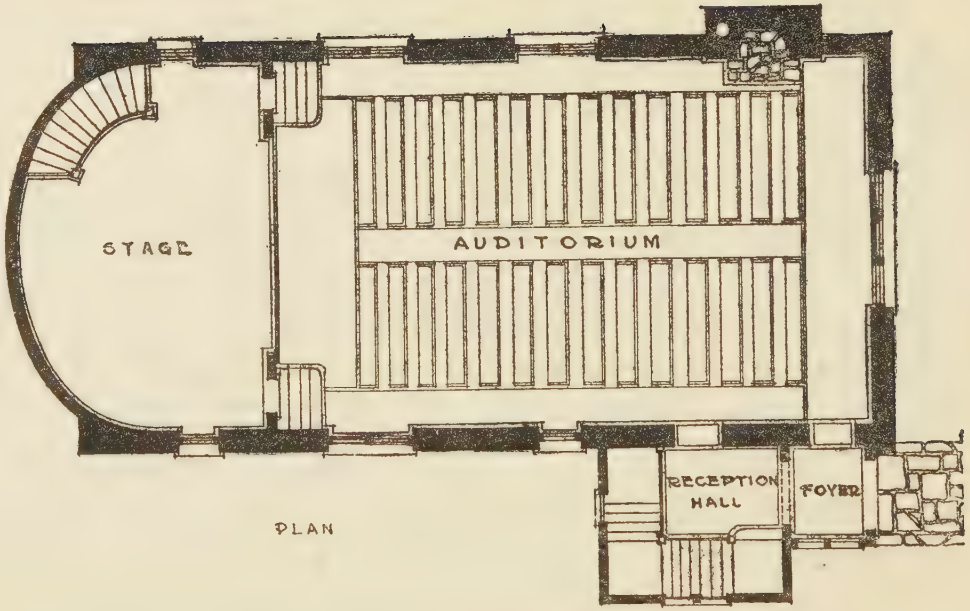
Section through the stage of Blythelea Theatre, remade by Howard Greenley, architect, from stables on the estate of Charles C. Goodrich of Orange, N. J., showing dome, adjustable sunken footlights and general lighting system. The region of illumination from each lamp is shown with dotted lines. The colors of the lights are indicated as follows: A, amber; B, blue; C, green; R, red. The door in the dome was an unfortunate necessity.

stability, freedom from wrinkles, and better diffusion of light.

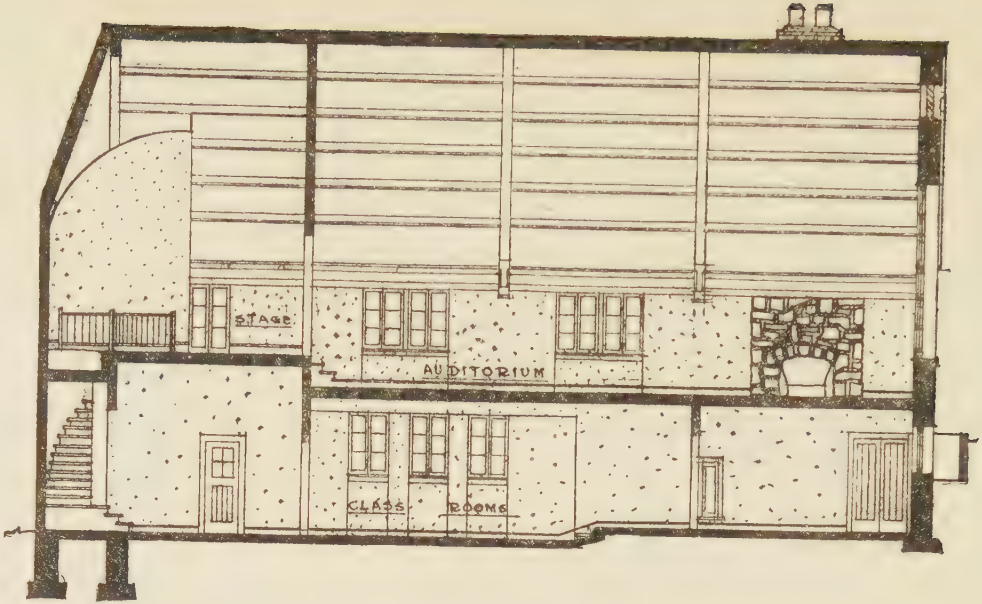
With a true dome, a great deal of the litter of painted scenery can be done away with. A background of light takes the place of the usual painted back-drop, and much of the scenery usually set at the sides or hung overhead, merely to keep the eye from penetrating to the back-regions of the stage, is no longer needed.

Added to the stage at the time of construction, the dome costs little more than the price of its materials. The initial cost will be saved many times over in the decreased cost of scenery. The very least that should be done, if the budget does not allow for the construction of an entire dome, is to plaster the back wall of the stage. This, more than counterweights, traps, revolving stages, and all the other paraphernalia of advanced construction, will extend the possibilities of the stage machine, not only for the uses of illusion but for the service of the imagination.

A familiar feature of most theatres in which productions are made is the paint-bridge and paint-frame at the back of the stage. Here the scenery to be painted, mounted on the frame, is raised and lowered before the bridge. To my mind, this is a waste of space and money. Primarily it is a waste of space at the back of the stage. If the dome is used it is quite out of the question. But, strongest argument of all, it is not needed. If the scenery must be painted in the theatre, it can be painted lying flat on the floor. The saving on this item may well be enough to cover the cost of the sky-dome.



The church as well as the school has come to cultivate the Little Theatre movement. Plans by Clarence Stein for the Community Church of White Plains. The building is used both as a church and as a theatre for the Fireside Players. The back wall serves as a sky-dome.



A cross-section of the Community Church and Theatre at White Plains, N. Y.

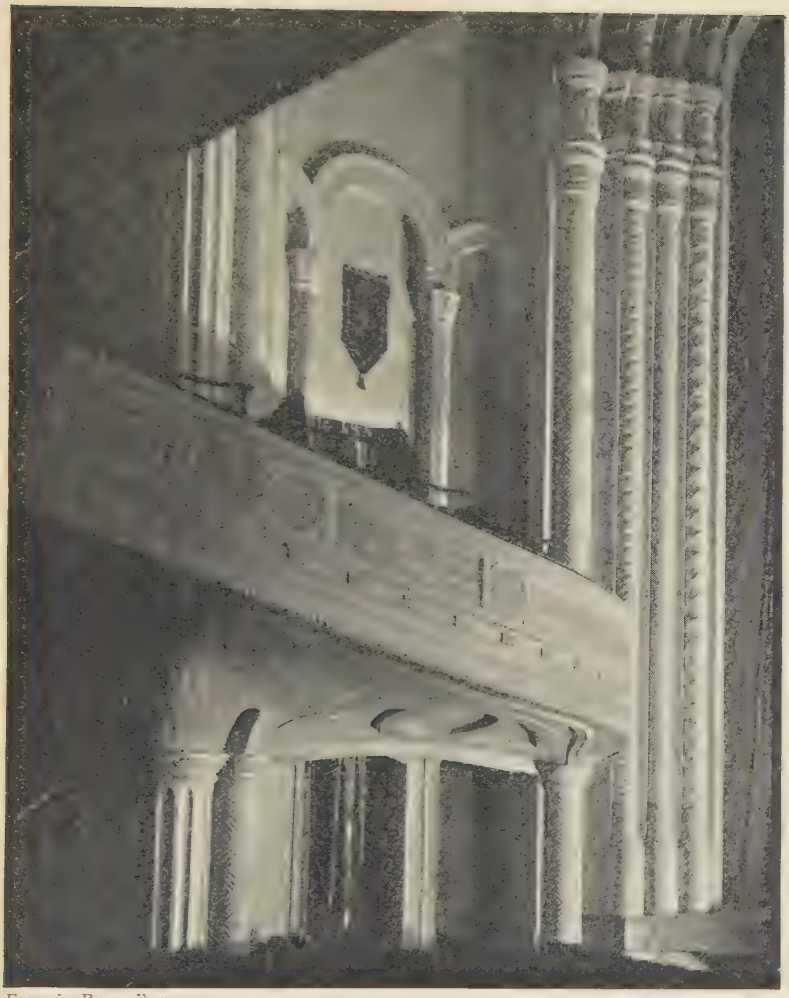
Chapter 7

PROBLEMS OF STAGE LIGHTING

The most vital part of the stage machine is yet to be touched upon, the only part in which any mystery is involved. After all, most of our machinery of the theatre is of the simplest type—ropes and pulleys and simple bracing. In a double sense, the electrical equipment is approached with more awe. While most people know a little about the simpler laws of mechanics, electricity, guarded by an element of danger, is a matter too recondite to be brought into the fold of everyday information out of mere curiosity, or to be reasoned out as the childish working of a pulley can be figured out by common sense; it has to be studied and learned. And besides being outside common matter-of-fact, light is mystery itself, unplumbed nature, a fraction of the inscrutable life of the world led by strings to the stage.

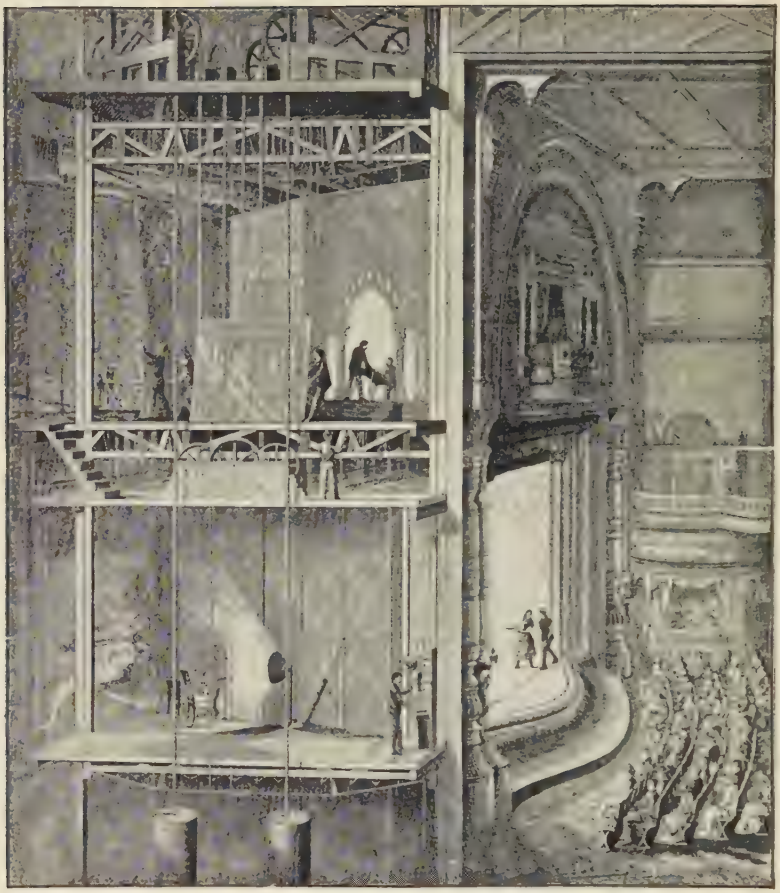
If the little playhouse is without any mechanical convenience, if its stage is cramped and mean, it can still achieve visual beauty through light. This force brings into the playhouse the most vibrant, subtle and affecting gift of the physical world, barring only the human presence.

Ultimately it will be seen that a forthright attempt to imitate nature on the stage can result only in failure; the



Francis Bruguière.

An uncommonly interesting photograph of the left-hand wall and proscenium arch of Martin Beck's new byzantine theatre. The balcony swings far round at each side, much as it used to do in the horseshoe-shaped auditoriums of fifty years ago. The ends, however, take the place of boxes, and the centre is thrown well out over the orchestra floor.



New York Public Library Collection.

The Madison Square Theatre was the sensation of 1879 because its equipment included the first elevator stage known to New York. As is shown above, in this illustration from an old *Scientific American*, one stage was in view of the audience while the other was being set. A change of scene could be made in forty-one seconds, with four men at each winch, and the process was soundless and without jars or vibration. The use of gas lights rather complicated the change, as flexible gas tubes trailed from stage to stage. Steele MacKaye had patented the idea in 1879, in the face of ridicule, but, in collaboration with Nelson Waldron, saw it work out into practical invention. The *Scientific American* noted that "many features were novelties, but there was nothing inappropriate or out of place."

painted or modeled semblances of rocks, trees, grass or distant prospects are in the long run seen to be what they are, not what they pretend to be. Similarly, close as the light of the stage can be brought to resemble the light of the outer world, it will still be short of complete fidelity to its original. But it is, in itself, a force of beauty, an authentic transplanting of the revealer of nature's divers beauties, so that, if it fails to achieve what the manipulator tries to make it do, it may achieve something more beautiful.

More and more can this be true in the theatre, as the artist comes to regard light as a pure medium, as he learns more of its profound effect on human emotion, even on the working of the body's organs, and as he becomes familiar with the thousand subtle ways in which the earth and its atmosphere modify the light sent by the sun, reflecting and refracting it, stealing certain colors from its whiteness and leaving others, resolving it prismatically by mists and clouds and the swirls of atmosphere. These are a few of the ways in which nature plays the artist with light. They point to unlimited lessons in technique that the theatre artist in light has yet to learn.

The little theatre, or any theatre for that matter, cannot go wrong by beginning at the beginning. Let it revalue the customary machinery for stage lighting, and the results achieved by its use. Later I shall describe this customary equipment, for it has its great uses, and much of the criticism that I shall apply to it applies perhaps with greater justice to the manner in which it is used. But, implicit in the system itself, is a criticism of its purpose to reproduce

the effects of nature under conditions that in nowise resemble those of nature, or its laying over a convention (artistic at its best, futilely anachronistic at its worst) not another convention, but a lantern of Diogenes, showing up shams.

Go back to the beginning. One candle rightly used, as in Robert Edmond Jones' lighting of the den scene in *Redemption*, is both drama and beauty. Imagine Wallace Stevens' *Carlos Among the Candles* shown upon the stage by the candle light of the strange room-world which is the play's universe. Here is a complete wedding of drama and the mobile beauty of light itself, a light we can readily achieve. From these candles to the sun of Shakespeare's comedies, the storms of his *Lear* or the mists and fogs of *The Tempest* is a far cry. He begged the question, in extraordinary verse, and acted the words and emotions of his plays in the plain light of day, which is bound to be beautiful, even when it is not illusive of the moon.

Right here lies the crux of the problem of installing lights in the little theatre. A dual approach is required, as in any art: the creator's vision of what he wishes to do, and the technician's knowledge of how to go about it. The greater responsibility rests on the first function, for we must settle whether we are to try to reproduce nature or attain a correlative beauty. To me the beauty of a stage sunset has rarely been the beauty of a real sunset; it has been the beauty of rosy light. If anything, the unreality of the sunset has stood in the way of my appreciation of the reality of red. The beauty of red was accidental, and not the artist's intention. It could not have been avoided, for it is germane

to sunset, but the fact remains that the artist achieved something other than he set out to achieve. It would have been better to go in for red and attain it than to go in for sunset and attain red. If blue light intimates the moon, well and good. It is beautiful itself, and does not awaken marvel at the cleverness with which we have contrived an effect. Whereas a nicely operated moonrise, or a jiggling procession of stereopticon clouds leaves us gaping while the tragedy hobbles, unattended, to its close.

When the theatre forsook the sunlight, it faced the question of light solely as illumination. By various means—torches and tapers, gas, "limes" and electricity—it has made its art visible indoors and at night. The introduction of electric light into the theatre has made possible an illumination so dependable and controllable that of late years attention has been turned to other phases of the lighting problem. Thanks must be given for most of the advance thus far to the effort of the illusion-theatre to imitate the light of nature. My belief is that the greater advance lies ahead, in the study of light on the stage as an art medium *per se*.

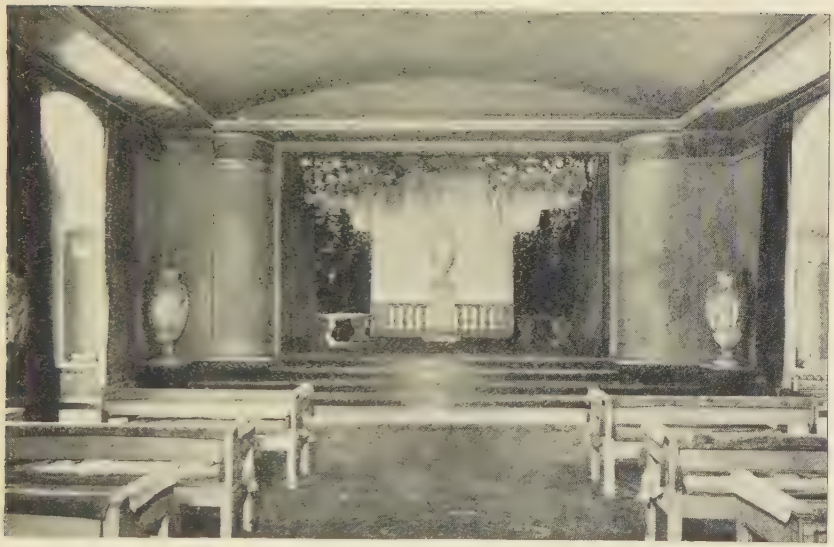
Two important things the stage worker of the modern theatre contributed, through his rough approximations of realistic effect, two things that will serve, whatever our aim in lighting. He saw that the light at some seasons, in some weathers, and at some times of day, is less bright than at others, and that it fades at dusk. He devised means, therefore, of varying its intensity. Second, he perceived that at sunset light is one color, at noon another, and by full moon another. He gave us dyes and color screens, and with

them and his dimmers brought to the stage the important element of control.

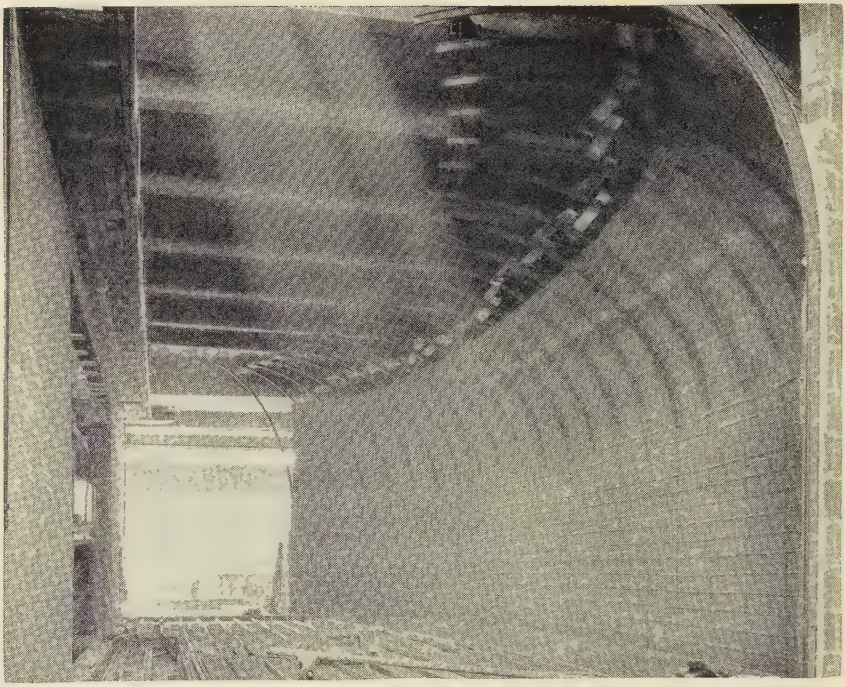
Other advances, through other agencies in the theatre, tend to subtilize the function of light, carrying it beyond primary illumination. Second, perhaps, comes the scene designer, who demands that the light, in addition to illuminating the players and stating the time of day or year, shall contribute values to his design as picture. It shall be made to cast shadows where dark masses are wanted in his composition. It shall highlight other features of the scene; it shall reinforce the painter's work with color; it shall give plasticity to the builder's work with its highlight and shadow.

Next, the dramatist and producer make their demands—the light shall reinforce the mood and meanings of the play. By its intensity or dimness, it gives "atmosphere"; by its color it has a direct psychological and physiological effect on the spectator, sensitizing him to values in the play he might not perceive were it enacted in light of another sort. Dramatist, director and designer, in the lighting of a play, if nowhere else, should be so much at one that it is easy to understand Gordon Craig's wish that one man should combine the functions of all three.

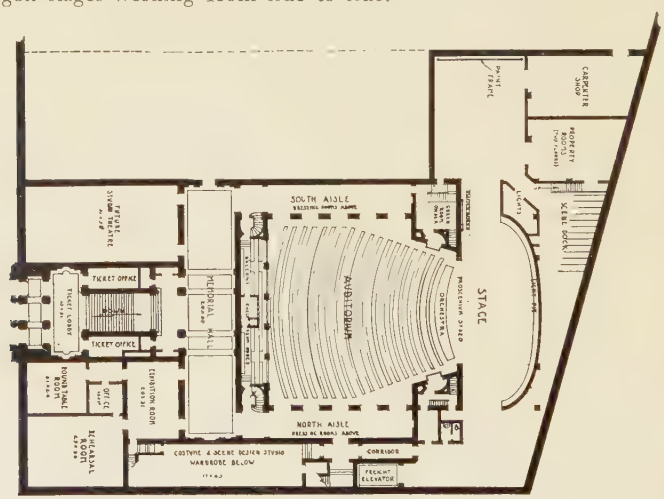
Light, in the theatre, then: (1) illuminates the stage and actors; (2) states hour, season, and weather, through suggestion of the light effects in nature; (3) helps paint the scene (stage picture) by manipulation of masses of light and shadow and by heightening color values; (4) lends relief to the actors and to the plastic elements of the scene;



The interior of the Blythelea Theatre on the estate of Charles C. Goodrich, in Orange, N. J., rebuilt by Howard Greenley from a stable.
(See pages 59-60.)



The plaster dome, under construction at The Goodman Memorial Theatre, Chicago, is eighty feet wide, curving over the stage at a height of thirty feet. The Proscenium opening is thirty-seven feet wide and twenty feet high, while the 165 foot expanse back of the curtain line gives space for two or three 32 foot wagon stages working from side to side.



The ground plan.

and (5) helps act the play, by symbolizing its meanings and reinforcing its psychology.

To achieve these five functions of stage light, five different kinds or sources of light are not, of course, needed. One light may combine several, or all, of these functions. In Joseph Urban's lighting and setting of the last act of *Tristan and Isolde* some years ago at the Boston Opera House, a beam of late afternoon sunlight struck across the stage to the figure of Tristan lying beneath a great oak tree. Slowly, as the day waned, the sun patch crept from the figure, until, at his death, it had left him in cool shadow. Thus, a light that illuminated, that told the time of day, that gave the figure of the singer and the bole of the great tree high relief by striking from only one side, also aided symbolically and psychologically in the interpretation of the drama. Thus to make light function in many ways is to use it with a sense of its ductility and subtlety as a medium of theatre art. In it we have the only single agency in the theatre that can work with all the other agencies, binding them together—that can reveal with the dramatist, paint with the designer, and act with the actors.

Chapter 8

LIGHTING EQUIPMENT

The problem of stage lighting is curiously unlike the other æsthetic problems of the theatre. The possibilities of expressiveness in acting, for example, are definitely limited by an instrument, the capacities of which, however great, are known and have been, in more than one instance, extended to their utmost. While there is an everlasting refreshment of experiment, technical study and approach to some sort of formal perfection in acting, it may well be—due simply to the mortality of actors and audiences—that the past has seen as great acting, of one kind or another, as the future shall ever know.

It seems to us much the same with the stage and its scenery. The stages of the Greeks, the Globe, the Vieux Colombier, set form above machine. Sandwiched between, the stages of Inigo Jones or the Bibienas, of Linnebach, Haseit, Strnad, or Norman Geddes, with their mechanical ingenuity, make architecture evanescent, or, at least, ductile. Both kinds of stage, most ancient or most modern, aim at a certain goal which has been as clearly apprehended in the past as it is likely to be hereafter, save as machinery is more perfect in the future.

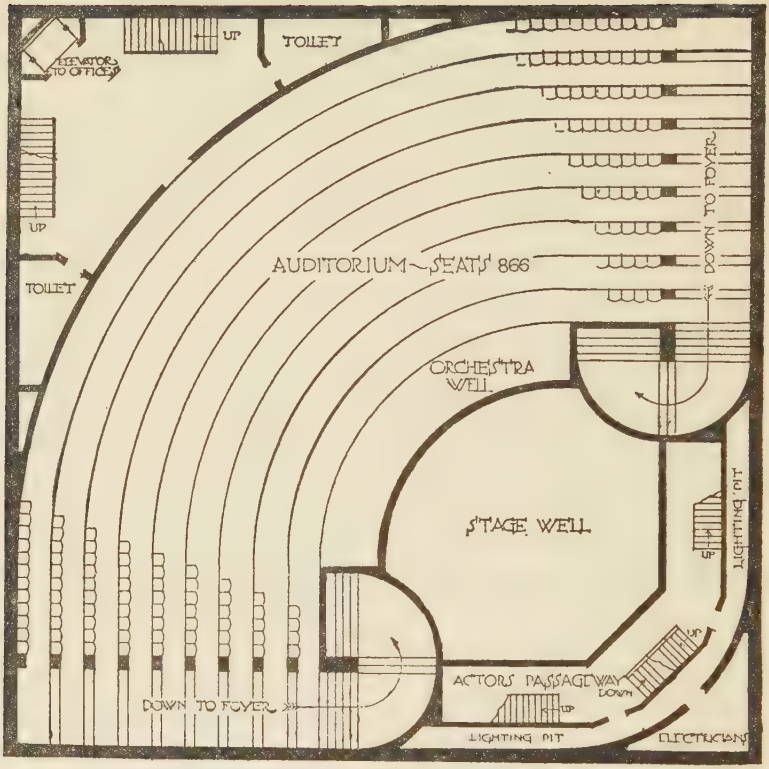
Above all, as the actor has a body with just so many

limbs and one face, familiarly featured, the theatre has one body—auditorium and stage; their relations may apparently alter, but the one must always, somehow, face the other.

Light in the theatre is exempt from this kind of limitation, for the means of its production have just begun to develop. In the imagination, in the great and lesser lights of the universe, we have caught a glimpse of a goal. The pathway is, however, just beginning to open, and means for travelling it are unlimited in possibility.

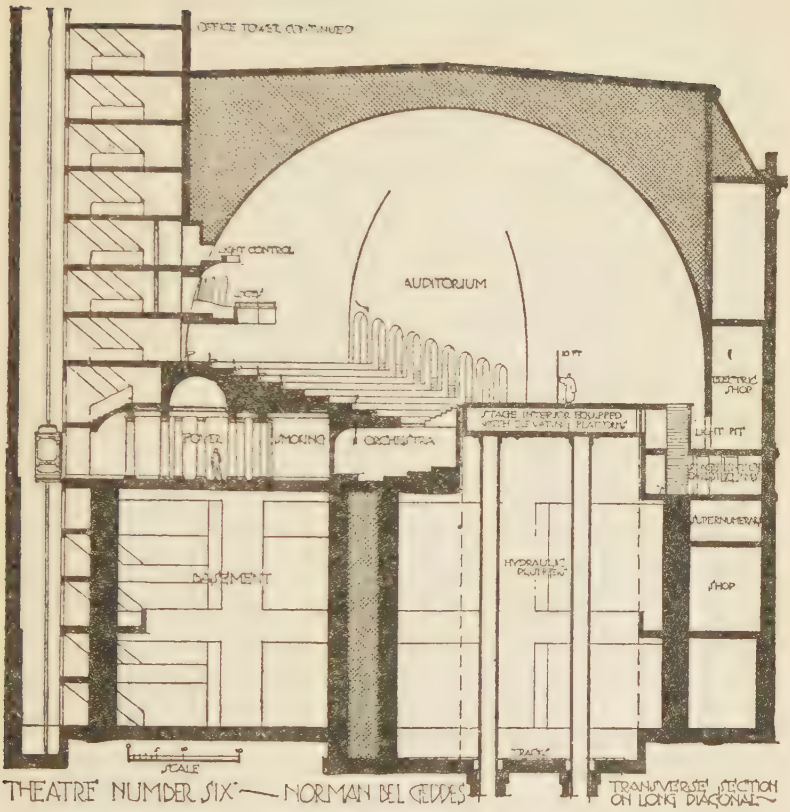
The art of stage lighting, unlike those of acting, architecture (theatre), stage mechanics, scene design and painting, costume, has almost no history. Such history as it has, until the past two decades, is simply the history of artificial illuminants. And it may be noted that in the history of illumination the point when new chapters came to be written in the theatre was the moment when each and every source of light did not need to be hand tended.

It is very little more than three hundred years ago that illumination and the theatre had their first meeting. The Greeks played by the light of the sun. So did Shakespeare and his fellows. A torch on the stage of the Globe or the Swan indicated night, but did not illumine it. And it may be worth considering that light, in these ancient theatres—the light of the sun—did not reinforce the "mood" of play or scene, but mitigated it. Œdipus, his eyes streaming blood, the wholesale slaughters of the Elizabethan tragedies, must have seemed happily a little less terrible to an audience seated in the sun.



'THEATRE NUMBER SIX'— NORMAN-BEL GEDDES

A plan for a new type of theatre projected by Norman-Bel Geddes in which there is no proscenium. The audience and the actors are both contained within the dome of the auditorium. The stage, which is located in the corner of the building, sinks into the basement for quick change of scenes. This plan shows a horizontal section just below the stage door. The stage itself covers the stage-well and the actor's passage and extends almost to the edge of the wall where the dome begins.



A section through Norman-Bel Geddes' proposed theatre, showing the dome, the seating arrangement, and the elevator plungers, on which the stage sinks into the basement for changes of scene. These drawings are reproduced from the Architectural Record, where they appeared in connection with an article by Claude Bragdon fully explaining the scope of this extraordinary project.

It is true that before the theatre moved indoors, once and for all, plays were performed by artificial light—at court, in schools, in Renaissance gardens lighted by flares and pyrotechnics. Even a cursory reading of the stage directions of the masques of Ben Jonson or James Shirley indicates frequent spectacular illumination. The methods of these elder technicians will some day be investigated and described.

Generally, however, dependence was upon the same means by which the audience chamber was lighted—candles hung in chandeliers. The lights above the stage might be lowered and those above the audience raised into a well, so that, during the action of the play, a differentiation between audience and stage might be effected. So, with slight modification, things remained for a century and a half. A row of candles along the edge of the stage, the first footlights, made the actors' faces a little brighter. The supplanting of the wax or tallow candle by an oil lamp gave a brighter light less in need of frequent tending, but did not change the emphasis from simple illumination to effect.

The introduction of gas, with its numerous burners placed along a feed pipe for borders and footlights, did more than make available for stage use a brighter, more easily handled light. It introduced as well the possibility of controlling the intensity of the light. The gasman became an important member of the stage crew. With the invention of the limelight for spotting and flooding, and the use of color which the lime made possible, the present-day situation sprang into being. The substitution of electricity for gas

has done little to change the aims of stage lighting (though it has made available a brighter and more flexibly controlled illuminant) except to add a new aim which we may term generically "effect" to the old, simple problem of illumination.

"Effect" aimed at the reproduction, through the control of light intensity and color, of the effect of the lights of nature. Illumination, by the use of more or less scientifically constructed border reflectors, improved. Color circuits enabled the operator to flood the stage with light of any hue. At first, and in many simply equipped stages to-day, this remains sufficient. Added to this general illumination, we have a variety of lights which can be directed to a given area of the stage—floods, spot lights, large and small strip lights.

Still, by and large, the lighting of the stage generally aims at the illusion of something other than a stage and the lights are made to give, as far as they can, the effect of a light source of wholly different physical properties. To a very slight degree, indeed, have the optics of the instrument now in hand been studied and the lighting machine used with reference to its inherent capacities. It should be possible, with a little ingenuity, to devise a machine far better adapted to the imitation of natural light, if that is to be the aim of stage lighting. The discarded Fortuny system and some of its modifications do, in fact, approach the illusion-ideal far more successfully than our border-flood-spot system. Every producer recognizes the uselessness of the machinery we have as an illusion machine. Accordingly,

we find every fair-sized production making almost no use of the stage switchboard or equipment, but carrying its own switchboard, dimmer box, specially constructed borders and junction boxes. Big travelling shows which depend upon scenic effect, like the various Follies, use nothing belonging to the theatre in which they play except the electric current.

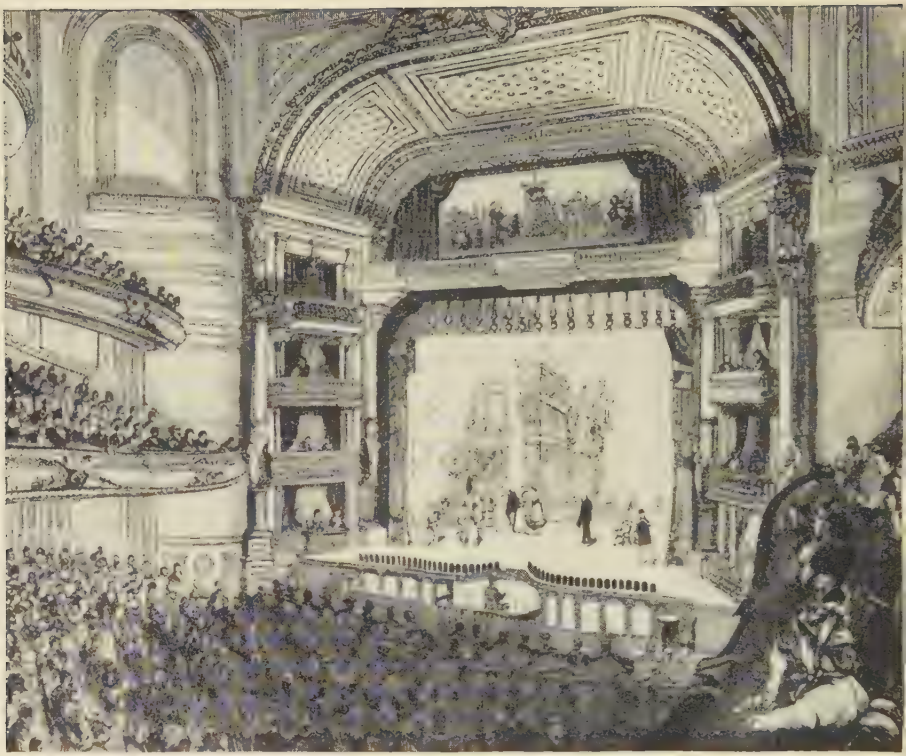
On the other hand, where sheer illusion is not the aim, the devices we have are being found capable of almost any demand that can be made of them, and, moreover, invention proceeds at a vastly more rapid stride when the artist or inventor seeks to apply the laws governing optic machinery and not to imitate the sun by means of light sources and lenses governed by different physical principles. As witness, we have had added to the resources of the stage X-ray type reflectors, parabolic reflector spots and, above all, the Clavilux of Thomas Wilfred, which is almost unexplored in its potentialities.

The machinery by which the medium of light is brought to the stage and through which its wonders are wrought commands a deep respect.

Of first importance is the machinery of control, the switchboard and dimmers. The customary place for the board in American theatres is at one side of the proscenium arch, either on the stage floor level, or on a perch raised some nine or ten feet above the stage floor. The manifest disadvantage of this location is that the operator cannot see the whole of the stage, and must depend for his cues upon a stage manager. It has, therefore, become the practice in

Robert Gould Shaw Collection, Harvard.

The old John Street Theatre, which was the only important theatre in New York from 1767 to 1798. Here the famous American company acted, and British officers passed their idle winters during the Revolution in playing at actor as "Howe's Thespians." Here, too, Washington, who was a good theatre-goer, came to sit in an especially built box when he entered New York as President. The greatest formality attended his visits. The leading player, with his wig powdered for the occasion, and carrying candles to light the President's way, met him at the door. Numerous guards were on hand, and the box in which he sat was hung with red and surmounted by the nation's coat of arms. The stage of the John Street, with its two proscenium doors, and the narrow auditorium before it, with hard benches for seats, seems astonishingly like the Provincetown Playhouse today. The side benches, serving as boxes, alone are different.



Robert Gould Shaw Collection, Harvard.

"Booth's Theatre is conducted as a theatre should be, like a church behind the curtain, and like a counting-house before," said Joseph Jefferson. But in spite of his brave attempt at management, Edwin Booth was forced to give up his theatre in 1873, four years after he had built it, because of its failure as a "counting-house." The building was not only one of the first playhouses built on Twenty-third Street, but one of the best-equipped theatres of its day. Above is a view of the remodelled proscenium, when *Rescued* was playing there. Note the wide apron, the hooded lights, the stage boxes, and the curving balconies. The painting, decorating the proscenium arch and entitled *Comédie Humaine*, followed an old tradition in our theatre. The New Theatre in Chestnut Street in Philadelphia, in 1793, had on its entablature an "emblematic representation" of *America Encouraging the Drama*, with the motto, "The Eagle Suffers Little Birds to Sing." This was later changed to the more moral phrasing of "For useful mirth or salutary woe!"

many European theatres to place the operator in a pit directly in front of the stage, shielded from the auditorium and facing the actors. From here he can watch the action and see the effects of his lights constantly. Telephone connections with lamp operators at the back of the stage enable him to keep them under his control.

The construction of the board and mounting of the switches are strictly prescribed by boards of fire underwriters in various cities, and need not be detailed here. The important consideration at this point is that, so far as possible, each light unit on the stage shall be subject to central control from a vantage point from which the stage can be seen; that each unit shall be subject to *separate* control; that groups of like units, classed by location or color, shall be subject to group control, apart from other groups; and that the stage light, as a whole, shall be controllable apart from the house lights.

That is, assuming, for purposes of illustration, the arrangement of lights common to most theatres, the white lights of the first border shall be controlled by a switch apart from that controlling the white lights of the second border or the third or the fourth. So, likewise, for each color circuit of each border, separately. Then there should be a white border main switch, controlling the white lights of all the borders, and a blue border main, etc. Above these, there should be a border main switch controlling all the border lights simultaneously. And thus with each division of the stage lights. Over all, one stage main switch should control all the lights of the stage. The auditorium

lights, with their own switches, should be controlled from the same board as the stage lights.

The outstanding item of expense in building a good switchboard is the cost of dimmers, the resistance devices by which the intensity of the light is controlled. They vary in capacity with their wattage and type. The dimmers, more than any other part of the control system, contribute to the flexibility of the machine. In a modern theatre they are indispensable.

So far as possible, there should be a dimmer for each switch on the board, controlling each light unit separately. With "master" levers, related light units can be ganged and controlled simultaneously. When only a limited number of dimmers can be afforded, it is possible so to construct the switchboard that circuits to be dimmed can be "shunted" through the dimmers, while circuits that need not be dimmed remain on constant. A very ingenious board of this type was designed by Mr. Bassett Jones for the Artists' Guild Theatre in St. Louis. This board has eight dimmers which can be used for any eight light units on the stage, giving it a far greater flexibility than it would have if only a particular eight could be dimmed. It is, however, rather complicated, with its dual system of constant and dimmer plugs and connectors, so that only great familiarity with it makes it quick in action.

In addition to the switchboard type of dimmer, there are also smaller dimmers made for use with nitrogen lamp spots and floods. Where these are used I believe they should be set by the main switchboard, rather than on the lamp itself.

Attached to the lamp they require an additional operator and break up the centralization of control.

The actual stage lights fall into two classes—stationary and movable. The stationary or fixed equipment of the average theatre has remained, on the whole, highly conventional. It consists, primarily, of the footlights, a trough of lights set along the floor at the front edge of the stage, throwing light upward upon the actors and the scene, and the border lights, hanging troughs, adjustable in height, throwing their light downward. The first of these border lights, often known as the concert border, hangs immediately behind the curtain or proscenium drapery, and the others are hung at intervals of seven feet from center to center. The footlights and borders are usually wired in three circuits, each circuit being filled with lamps of a different color, customarily white, red or amber, and blue.

Of late, these customary units have been put on trial and found wanting. They serve principally, and almost exclusively, the first function of stage light—illumination—and are found, on the modern stage, not to serve it well. Footlights, especially, have come under the ban, though the campaign against them has been waged a little indiscriminately. When footlights alone are used in a realistic scene, they are bad. If the light from the floor dominates, the under surfaces of the face—chin, nose-tip, eyelids—are unnaturally and disagreeably accentuated. If the light from below and above is balanced, the result, though more natural, is perhaps as bad, for the lighting is flat, and there is no relief in the features or figures of the players. For

plays and scenes of a heroic or fantastic sort, treated decoratively, rather than literally, lighting entirely from above gives interesting and picturesque results. It shadows the features heavily, and lends a sculptured, massive quality to the face. More and more, this overhead lighting has come to be used, and with some producers has been made a fetish.

The very quality that makes this sort of lighting interesting in scenes of a certain kind exhibits its strongest disadvantage in naturalistic lighting. In the average room, during the daytime, light pours in through windows, striking faces at face level. The light comes mostly from one side of the room, or if there are windows on more than one side, and the light comes in several directions, it comes in varying degrees. The sun does not shine in two directions at once. That is to say, though light may come from more than one direction, and be reflected multitudinously by walls and ceiling and, in less degree, the floor, the balance of intensity is always in favor of one direction. And this direction is not up or down, but in a line approaching a right angle to the erect figure.

Something of the same sort is usually true out-of-doors. Only at noon do we have literally overhead lighting. Even then, the beam of light is so broad as to envelop the figure on all sides, and is so variously reflected by the dome of the sky, by trees, rocks, water, houses, that there is, in addition to the direct downward light, a considerable "general" diffused illumination. At most hours of the day, the rays of the sun fall upon the earth and its people at a long angle.

The factor that gives relief and prevents a dull flatness in the light of nature is the dominance of east over west in the morning and of west over east in the afternoon. Night illumination indoors, though usually from fixtures above head-level, is reflected by all the walls of the room and by all the objects in it.

A soft, diffused, face-level lighting is thus warranted in almost all circumstances. The hard glare of foots and borders, used unrestrictedly, does not supply this need most happily. Used moderately, footlights have a distinct function, until better means of moderating the crude shadows cast from above shall have been devised.

There has developed during the last few years an increased use of lights from the auditorium that throw light upon the stage at an angle less perpendicular than that of footlight and border. At the Little Theatre in New York, certain sections of the ceiling paneling can be lowered and light thrown upon the stage by diffused spot lamps at an angle of 45 degrees. The new Theatre Guild Theatre and many others of the newer theatres have developed lighting from the front. Many theatres now light from the face of the balcony—a form of illumination with which Granville Barker experimented in his American season at Wallack's Theatre, and which Mr. Belasco has developed in his own theatre. Robert Edmond Jones has, of late years, been using a box of lens lamps on the balcony of any theatre in which he required them. I believe that in good time beautifully designed lighting units will be frankly set or hung in the auditorium of the theatre.

The footlight equipment of most theatres is, as it has long been, unmodified, consisting merely of rows of incandescent lamps of low standard (usually forty watts). The border lights have seen more innovation during the past few years, especially the first (or concert) border, most used in lighting interior scenes. Originally, these border lights were intended to light not only the stage, but also the hanging strips of canvas (known as borders) formerly used to suggest a ceiling in interior scenes, and still used to represent foliage and to misrepresent the blue sky in exterior scenes. With the use of flat ceilings for interiors comes a demand for a light that illuminates the scene rather than the ceiling. This is best supplied by the X-ray border, made up of a smaller number of lamps than the old border but of higher standard, each lamp being 150 or 250 watts. Each lamp is set in a separate compartment, separated from its neighbor, and each lamp is backed by an X-ray reflector of mirrored glass with whorled corrugations, diffusing the light evenly over a large area. Each compartment may be fitted with a color screen of gelatine or dyed glass. Often, too, spot lamps, large and small, which use concentrating lenses, are mounted on this border to accentuate the light on certain areas of the stage.

The other borders, used mostly for exterior scenes, must serve to flood stage and scene with light. The old type of border does not serve adequately, even in the type of scene for which it was designed. The use of sky borders has largely given way to the high cyclorama of canvas or plaster, leaving the sky prospect open to the eye as far as the sight

line reaches. The overhead lighting must be powerful enough to flood stage and sky with light. It is becoming more and more common to reinforce the ordinary border-light equipment with hanging thousand-watt lamps in specially constructed steel hoods.

The footlights and border lights, and, occasionally, vertical strips inside the proscenium frame at the sides, constitute the whole of the stage-lighting equipment that is more or less a part of the structure. They "go with the building." Everything else is movable and falls into the second classification of lighting units. But, in the structure of the stage, provision must be made for the use of such additional lights. Outlets in the form of "stage pockets" are set at regular intervals in the stage floor; into these pockets, spot and flood lamps may be plugged. The pockets are set in the stage floor in two lines running up and down stage, a short distance behind the proscenium opening, at either side of it. There are usually from four to six such pockets on each side of the stage. Sometimes there is one at the back of the stage, and one or more in the fly-gallery. Occasionally, also, in houses which use alternating current, there are pockets served by a small house generator, supplying direct current for the use of arc lamps. In some theatres, also, there are pockets connected with storage batteries, intended to supply an emergency service or for use with lighting units of a voltage other than the usual 110 volts. The pockets must, of course, be carefully insulated, and covered with a hinged iron lid set flush with the floor.

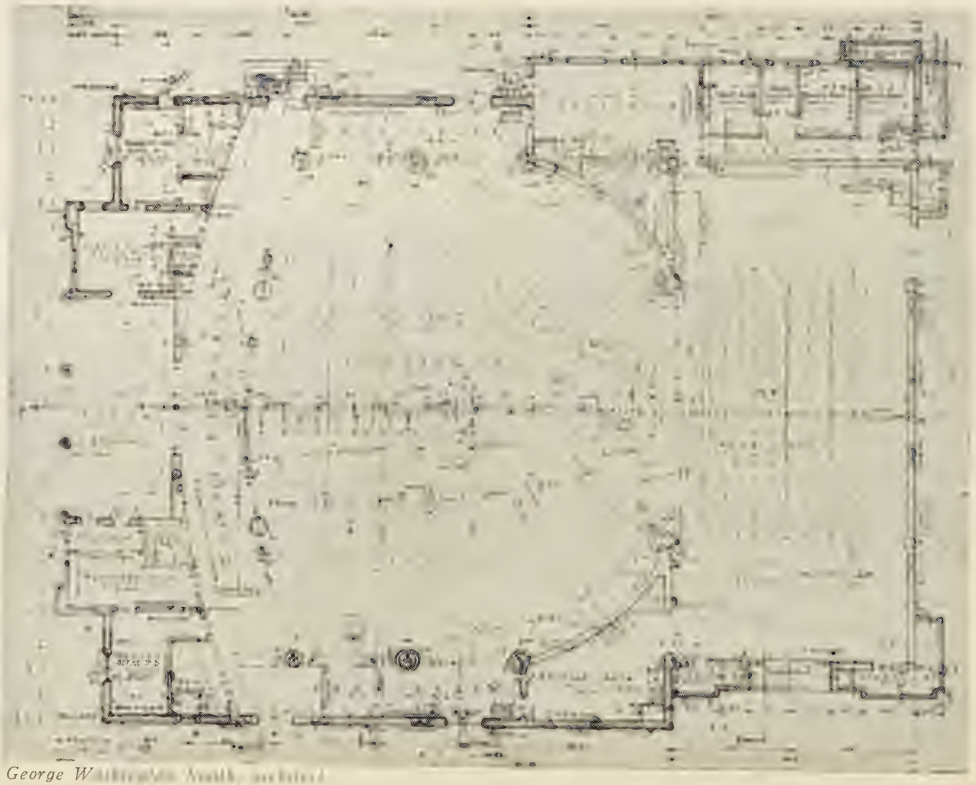
The movable lights are of two general types: flood lights,

for general diffused illumination, and lens lights, for concentrated, direct "spotting." Under the first heading may be classed all special lights known, in stage parlance, as strips, floods, or bunches. Strips are small troughs, fitted with from three to ten sockets, and are used in lighting off-stage "backings," set-pieces of scenery, and small areas where a special accent of color or intensity is wanted. Bunches, now largely obsolete, are hoods set on extension standards, fitted with ten or twelve sockets each. These have been replaced by flood lamps, burning 500 and 1,000-watt nitrogen-filled mazda bulbs. The hoods of these flood lamps have diverging sides or are fitted with a reflector behind the light, and have grooves at the front of the hood for carrying color-frames. Formerly such lamps were equipped with arc lights, but the nitrogen lamp has wholly displaced the arc in flood lighting. Its advantages are that it does not require an attendant to "feed" the light, that it can be dimmed, giving it range of intensity to make up for decreased brilliance, and that it can be burned on either direct or alternating current, without the annoying buzz of an arc light burning alternating current.

Spot lamps are mounted in closed iron hoods, emitting light from only one end through a lens. The hoods, like those of flood lamps, are set on extension standards, and can be tipped up or down and turned from side to side. Arc spots are still in general use, as the thousand-watt lamp is not sufficiently brilliant for use on large stages or for long throws. In little theatres, however, the thousand-watt spot is bright enough and has all the advantages over the arc

L. W. Collings.

The new Lobero Theatre, home of the Community Arts Players of Santa Barbara, California, was designed by George Washington Smith in the Spanish style with red-tiled roofs, stately pillars springing from a warm brick terrace, arcaded façade and towering stage house. It is visible all over the valley and has the air of a casino of old Spain. Its interior is tinted in warm buff with amber-globed bracket lights and nile-green hangings, and the ceiling is decorated in small blocks of colored mosaic.



George Washington Smith, architect

As its finest possession the Lobero Theatre has an excellent stage equipment, commodious [illegible] of dressing rooms, modern lighting apparatus and a roomy, workable stage. Its audi-

that apply to the newer type of flood lamp. For such small stages, the principal consideration always should be centralized control, and it cannot be got with the arc light. As incandescent, gas-filled bulbs of still higher standard are developed, the arc spot will cease to be used, even in large theatres.

There is also a small variant of the spot light, known as a "baby" spotlight, burning a lamp of 150 or 250 watts. Used with care, this is one of the most valuable stage lights we have for producing delicate variations in light volume and color in particular areas of the stage. These small lights can also be dimmed.

I have referred above to hanging hoods with thousand-watt lamps for general illumination. Where these are not made a part of the permanent lighting equipment of the theatre, they may be introduced for special scenes and effects, being hung where desired, and massed in such numbers and of such colors as needed. The hoods are equipped with chains by which they may be hung upon pipe battens and tipped as desired. They are plugged, like other movable lights, into floor pockets or fly-gallery pockets.

The color of light on the stage is obtained in three ways. Where lamps of low standard (twenty-five or forty watts) are used, as in the foots or borders, they may be coated with dyes, put up for the purpose, made with a collodion base. The burning lamp is dipped into the liquid and left alight until the dye coat has thoroughly dried and hardened. Bulbs of high standard, however, cannot be dyed,

as the dye does not stand up under the intense heat generated by a lamp of one hundred or more watts. As a matter of fact, few of the commercial dyes are wholly satisfactory, even with smaller bulbs. The blues especially deteriorate under heat, either fading or cracking, or burning to a purple or black.

The rays of larger lamps, burned either in flood or spotlight hoods, are colored with gelatine mediums, held before the light in frames of proper size. The gelatine colors also fade under heat, and, being very fragile, crack and tear, and must be frequently renewed. For durability, the best color medium is a sheet of glass with the color blown in. Unfortunately such glass is very costly, cannot be had in a large range of colors, and is usually not as translucent as might be wished.

Mr. Munroe Pevear of Boston has made interesting experiments with mediums of dyed glass. He manufactures his own dyes, and claims for them a much longer life than the commercial variety enjoys. His mediums are highly translucent, and are, of course, far more durable than the gelatine mediums. He makes them, however, in only the three primary colors, for his development of color screens has been ancillary to experiments of a larger intent—the development of a synthetic lighting system.

The principle of his color system is simply the principle of the prism inverted. The prism breaks white light up into its primaries. Mr. Pevear unites the primaries to make white. By combining his red, green, and blue light in varying degrees of each, he is able to obtain any color

in the spectrum. To pale out his lights to tints, he includes in his border and footlight equipment a fourth circuit of white lights. Experiments with synthetic lighting have been conducted at various times and places by Sam Hume, Norman Geddes, the present writer, and others. The results more than reward the effort of such experiment, and I commend a study of its possibilities to all workers in little theatres.

In addition to the typical theatrical lighting units, other units, not designed primarily for theatrical use, are being adopted. Foremost among these are the reflectors of the X-ray type. These are made in a number of sizes and shapes, but are of two types, the whorled reflector and the parabolic reflector. The first type gives a diffused light and the second a concentrated beam. The X-ray flood lamps, manufactured for lighting the exteriors of buildings and for illuminating night construction jobs, are coming to be used on the stage. They can be focused, have a higher efficiency than a lens light burning the same number of watts, and produce a more pleasant spot than the sharply defined light-area of the conventional spot light, projecting a brilliant ray, most intense at the center and fading toward the edges of the field. There are a number of firms manufacturing lights of this type, and they are now generally used for lighting outdoor pageants. They are quite as valuable in the indoor theatre as on the pageant field.

I have used frequently, instead of baby spots of the regular type, automobile windshield spots, burning a six-

volt lamp. These cost perhaps one-tenth as much as the regular type, and can be used on a special circuit supplied with current either through a small step-down transformer or from a storage battery, kept continually charged by running current into it from a strip of carbon lights wired in series-multiple. These windshield spots are usually equipped with a swivel and trunnion mounting, so that they can be turned in any direction, are focusable, and have a clamp by which they can be fastened to pieces of scenery or upright pipe standards in the proscenium entrance.

Besides a goodly number of well-distributed stage pockets into which movable lamps may be plugged, there should be points of vantage from which lights may be cast, perches and bridges elevated above the level of the stage. Most useful is a bridge across the stage, just inside and above the proscenium. From this bridge, special flood and spot lamps may be manipulated. Often perches are built out from the wall at either side of the proscenium from which spots may be thrown down to the stage. Occasionally these are movable structures with several levels and can be wheeled to various points off stage. The fly-gallery, also, is used for spot lighting. When a false proscenium is used, the overhead bridge and side perches are sometimes built into the structure.

In planning the lighting equipment for a small stage, all thought of the usual theatre installation can be set aside. Border lights of the old type are not useful enough to warrant the expenditure of the money they cost. Footlights, too, though useful when no better means of front

There were little theatres in those days. The central garden of the House of the Amorini in Pompeii. In the intervals between the columns hang stone masks. The larger opening to the left was presumably the stage.

Just off the main street of Carmel-by-the-Sea and behind the row of pine trees that lines it stands the Theatre of the Golden Bough, where Edward G. Kuster has built one of the best equipped community theatres in the country. The building draws its architectural inspiration from ecclesiastical buildings of old Lombardy, and seems almost a stage setting in itself at night when one passes under a wrought-iron sign into the flagged court-yard, where pines cast shadows on the rough stucco walls and warm yellow light streams from the windows.

lighting can be devised, can well be replaced by face-level lights from the auditorium, concealed by wall traps or by the balcony rail, or hidden in decorative coverings suspended, chandelier-like, from the ceiling. The essentials for a flexible, adaptable lighting system are centralization and delicacy of control, numerous and well-situated current outlets, and as wide a variety as possible of movable lamps for flooding and spotting. There should be enough circuits to allow the use of a three- or four-color system, along the lines of the synthetic system described above. Along with this there must be facilities for throwing light from above the stage from bridges and movable platforms. The only permanently installed piece of lighting equipment that is absolutely necessary is the X-ray border at the front of the stage for the lighting of interior scenes.

With a carefully planned switchboard and dimmer-bank, and numerous pockets or current outlets, for the initial equipment, there is hardly any limit to the development of the little theatre's lighting facilities, for if it must begin with only a few lighting units, it can acquire more from time to time, and with each acquisition build up its means of achieving beauty. And in this direction the most vital contributions to the craft of the theatre are yet to be made.

Chapter 9

STAGE MACHINERY AND SETTINGS

I HAVE made mention earlier of the ingenuity so often demanded of the little theatre stage director. The limitations of his stage often compel him to an inventiveness different only in scale from that displayed by the great German technicians of the theatre. No Harvard student who ever shifted scenery for the Dramatic Club in Brattle Hall can outgrow his enthusiasm for the feats achieved on that absurd stage. At the Artists' Guild in St. Louis, it gave us unbounded glee to set the massive chamber of *The Queen's Enemies* on the cramped stage there. To be confronted with deficiencies of one sort or another—mechanical or fiscal—which must be overcome, is unquestionably a spur to ambition. To struggle with material barriers, space, time, physical means, and accomplish results in spite of them; to wring beauty out of meagre cheesecloth and tinsel when there is no money for silk and gold galloon, is a battle of sorts; and without the fighting and winning of such battles as these, half our little theatres might never have been, and much of their best work might not have been done. I wish to qualify fundamentally my admiration for the ingenuity of the mechanical features of the modern stage. In fact, I do not believe they can ad-

vance the theatre one jot. They are marvelously ingenious in denying the limitations of the stage and in part triumphing over them. Yet I have a persistent feeling that the recognition of the limitations and the acceptance of them is more fundamental in the development of an art or craft than the denial of them and the triumphing over them. Even such a triumph has its ultimate boundaries, and when they have been reached, there is little to do but acknowledge defeat. When matter has been twisted and beaten into the cunningest perversions of its first form, the craftsman is still not satisfied; for his spirit can soar to further reaches where none of the elements can follow. This is truer of the theatre artist, perhaps, than of any other, save the musician (who is, after all, a theatre artist). The theatre has been, these many centuries, the theatre *because* of the limitations that encompass it, not in spite of them. Likewise is the church (as a field of art) limited, and it is by merit of its limitations that the church has been great. Utter *churchliness* owes little to the style of architecture of any specific church edifice. And the transcendent theatre art of the Deutsches Theater in Berlin or of the Art Theatre in Moscow does not hang upon the skill with which the one has used a revolving stage or with which the other has devised its scenery. The German theatres have to a remarkable degree increased natural illusion in scenery and lighting; but in spite of that there is about as much bad theatre art in Germany as good. Where greatness is found, where the artist has most truly realized the function of the theatre, it will be seen that his spirit has tran-

scended utterly the possibilities of his physical stage; and, like as not, he has made no effort to strain the capacities of his medium, but has worked utterly within them. One of the remarkable facts about the stage technique of Robert Edmond Jones is that he demands nothing impossible to achieve. His designs are easy to execute, and his scenery easy to handle.

Here, again, is the dilemma which we faced in the discussion of the approach to the stage lighting problem. There are limits to our ability to reproduce on the stage the light effects of nature. But there are practically no limits to the theatrical expressiveness of light, regarded as a medium, *per se*. There are limits beyond which mechanical skill or inventive genius cannot alter the obdurate confines of the physical stage. But there are no heights to which a human spirit, set in public upon a platform, however narrow and close-walled, cannot rise. In view of this great spiritual fact, I would solemnly warn any little theatre or community house that has money to spend for modernity, not to spend it on the kind of advance stage machinery discussed in this chapter, but to spend it on artists. Practically all modern stage machinery has been devised to heighten effects of nature, and therein it differs from the machinery of the theatre of the greatest eras, which was devised to produce effects *beyond* nature. The Greeks and Elizabethans left Nature strictly to herself, but had a fairly elaborate mechanical system by which they exhibited gods, demons, ghosts, and visions.

One of the first mechanical improvements of our present-

day stage was the *drehbühne*, or revolving stage, invented by Herr Lautenschlager. Its purpose is to move, without inordinate intermissions between acts, scenery far heavier than men can handle. The cult for realism demanded a greater plasticity in scenery, and consequent increase in mass and structural complexity. The revolving stage is a great turntable on which as many as six or seven scenes can be set at one time, and revealed successively to an audience by revolving the table. The scenery for the entire play is set up on the day of the performance, and no shifting of scenes need be done during the progress of the play.

The designing of scenery to fit the revolving stage, developed to its highest point by Reinhardt, is so little understood in this country that our few revolving stages are seldom used. The Century Theatre stage in New York has a turntable, but I do not know of any instance in which the scenery for an entire performance was set upon it. Mr. Winthrop Ames had a revolving stage installed in his Little Theatre in New York; but, as this stage is only thirty-five feet in diameter, he found it inadequate for the setting of many of the scenes. Mr. Harry Bishop, in building the Liberty and Fulton Theatres in Oakland, California, constructed revolving stages of adequate size, but evaded the problem of devising scenery especially for them by installing a revolving gridiron also, so that the old-fashioned sky and foliage borders could ride around the stage with the set to which they belong. A little labor is saved in shifting scenes during performances, but I doubt whether

the saving equalizes the cost of installation of these expensive devices.

A device of similar intent is the sliding stage, a great wagon the size of the stage opening—or, rather, two or three of them—run, as desired, before the proscenium opening, and capable of being pushed off, after being used, into houses at either side of the stage or lowered to the basement, there to be reset for another scene. This device avoids some of the limitations of the revolving stage, in that scenes need not be made to articulate closely as they must in order to fit the circular bounds of the turntable; but it is tremendously costly, and requires a great stage space.

There are other devices of like intent, such as the Asphalia stage, built in transverse sections that can be raised and lowered on hydraulic plungers, and Steele MacKaye's elevator stage installed in the old Madison Square Theatre, New York. None of these devices can serve either the little theatre movement or the art of the theatre. They are deadening, and divert effort from the true end of all experiment and advance in the theatre. There is no doubt in my mind that the sort of theatre that wants to be built is one in which the machinery is reduced to a minimum—efficient, controllable, but never controlling the sort of work that must be done on the stage. In order to have a modern, well-equipped stage, none of these innovations is needed.

Of far more purpose, for the modern theatre, are certain tendencies now manifest that appear at first glance like re-

versions to an older type of stage. I refer chiefly to such a stage as that built by M. Jacques Copeau for his *Théâtre du Vieux Colombier,* which, for two seasons, was a strange intruder among the more literal stages of New York. Indeed, save for the use M. Copeau made of modern mechanical flexibility, his stage was a first cousin to the Elizabethan stage, though his arrival at its particular form was not a case of atavism but a philosophic realization of the true limitations of the theatre. His stage consisted of three parts: a fore-stage, reached from the rear stage, or from the main floor of the auditorium by steps upward, or from doors high in the walls flanking the proscenium, whence steps led down to the stage level; second, the stage proper; and third, an upper stage, or balcony, engirdling the main stage. This balcony and the space below it might be variously shut off from the main portion of the stage, by tapestries, lattices, screens, or sections of scenery, flat, or pierced with windows or doors. Steps could be variously placed to give access to the balcony.

Thus, without the use of strictly representative scenery, Copeau had a stage which provided every facility for the presentation of a play—entrances, exits, and elevations. It gave scope to the necessities of action and the agility of the actor. Such a construction may be said to be as much scenic reform as reform in mechanics, except that it largely renders the latter unnecessary.

I should not deem it part of the purpose of this paper to mention scenic matters at all, were it not that, very often, a certain amount of scenery, like a certain amount

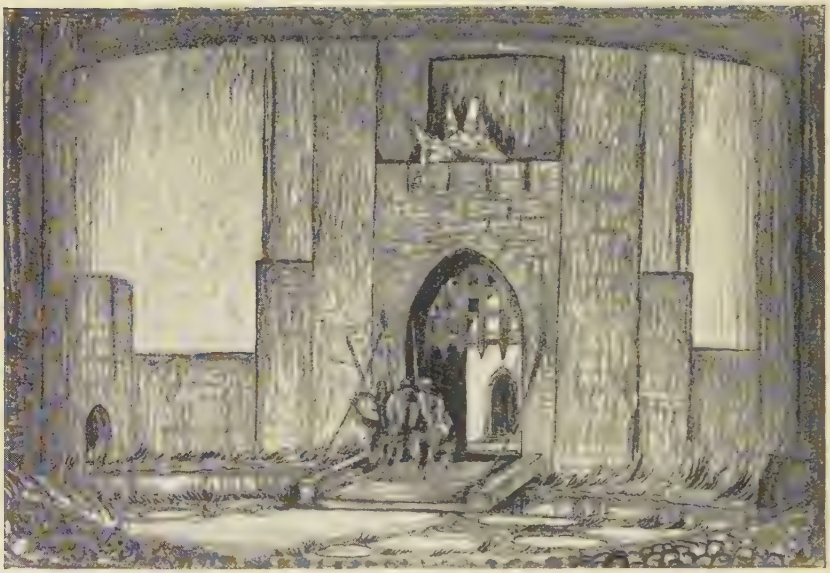
of lighting equipment, "goes with the building." The contract for the building and its rigging often specifies also a "garden," "plain chamber number one," and "fancy parlor number three," or the like. Whether they are thrown in or not, without extra charge, they should be courteously but firmly refused. They stunt the timid imagination, and somehow, perhaps because they are "real" scenery, never get thrown away.

For the scenic equipment of the stage I can do nothing better than refer the reader to the permanent setting devised by Sam Hume for the Detroit Arts and Crafts Theatre, of which he was for two seasons the director. This setting consists of a certain number of interchangeable units, flats, door pieces, window pieces, arches, and pylons.[1] Its initial cost is low, far lower than that of several sets out of the scene painter's catalogue, and its usefulness infinitely greater. In addition to this it has beauty.

It may be that the stage of the future is to be something quite different than that we now have. As a theatre of truth supplants the theatre of illusion, it may be found that the stage of to-day does not answer at all. The theatre is undoubtedly in a transitional period and artists are striving for new forms and new methods of presentation. What directions these tendencies may take it is not the purpose of this book to forecast. Nor would it do to advise the adoption of a type of stage not yet tested or of widespread use. Where there is an experimental and creative attitude

[1] See *Theatre Arts Monthly*, Vol. I, no. 3. Mr. Sheldon Cheney in his *The Art Theatre* has also fully described and illustrated this set, showing the multiple variations it is capable of.

Ten years ago the theatre to which we are accustomed, with its peep-hole stage and horseshoe auditorium, seemed safe from the reformer's fingers even when playwright, designer, producer, were upsetting conventions in their lines. To-day, every creative theatre architect who has the opportunity, experiments with each detail of form, lighting and equipment, collaborating with our playwrights in creating a new freedom for the arts of the theatre. In his experiment, Herman Rosse has made a series of interesting designs for theatres adapted from the Continental Circus. The design above represents a temporary theatre of wood and canvas in the circus form as he imagines it set for a rococo extravaganza.



Another of Rosse's designs for a circus theatre represents a mediæval scene with transparent scenery used in conjunction with a practicable castle. The gateway is the usual entrance for men and horses underneath the stage of the circus; the balcony above is the stage itself.

toward the theatre such types will be evolved without any such rudimentary manual as this. Where a manual is wanted, a stage should be built that can be used easily, by everybody who wishes to use it, and which will give readily, in return for effort spent upon it, a revenue of beauty. These pages will achieve enough if they go a little way toward eliminating the usual inept, difficult constructions that for these many years have cumbered the way of folks, young and old, who wish to entertain themselves in the theatre. More and more, they seek such entertainment at their own hands. More and more, their efforts are being fostered by educational bodies and organizations allied with the theatre. Such aid as this book may bring them is hopefully dedicated to their service.

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